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# Predicting intentions of physical therapy students to practice primary prevention

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# PREDICTING INTENTIONS OF PHYSICAL THERAPY STUDENTS TO PRACTICE PRIMARY PREVENTION

by

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A Dissertation in Partial Fulfillment of the

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Each person whose signature appears below certifies that this dissertation in his/her opinion, is adequate in scope and quality as a dissertation for the degree Doctor of Public Health.

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ABSTRACT OF THE DISSERTATION

Predicting Intentions of Physical Therapy Students

To Practice Primary Prevention

by

Sharon Potter Anderson

Doctor of Public Health in Health Education and Promotion

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Physical therapy (PT) has traditionally been a hands-on, tertiary-care field. Although the American Physical Therapy Association has mandated a broader perspective, little primary prevention is yet being reported in the U. S. An attitude change toward prevention must occur if physical therapists can be expected to become involved in preventive physical therapy. The purpose of this project was to determine predictors of physical therapy student intention to perform primary prevention with a questionnaire based on Ajzen's Theory of Planned Behavior. The theory uses attitude, subjective norm and perceived control to predict intention based on beliefs and strength of beliefs in each of the three areas. Five successive masters classes (juniors, seniors, masters, graduates, and advanced masters) in Loma Linda University's 3-year physical therapy program were tested ($n$ = 266). The classes showed no significant differences in intention to perform preventive physical therapy. Attitude, subjective norm and perceived control did significantly predict students' intention to do preventive physical therapy. Hierarchical multiple regression

produced unclear results with high variable intercorrelations and several negative betas, so factor analysis was used to group these variables into factors which represented the respondents' predictor beliefs. Multiple regression and factor analysis determined five separate factors which contained variables predicting intention to perform physical therapy primary prevention. Predictors of a positive attitude toward prevention involved Professional and Social Benefits (create new opportunities and market physical therapy, lead to a healthier society etc.), Patient Benefits (fewer acute injuries, prevent PT problems etc.), and Physical Therapy Practice (do research on prevention, present information to large groups etc.). Negative Outcomes (less jobs, less time, no pay) was not a predictor. The single significant subjective norm predictor involved People (your family, patients' families, schools etc.). Unpredictable Groups (physicians, insurance companies etc.) and Authority (employers, government) were not significant predictors. For perceived control, the significant factor was availability of necessary Educational Resources (understanding the target group, advertising, personal skills etc). Funding (insurance, HMO's, government) and Health Professional Support (other health professionals, PT's, MD's) did not predict intentions.

This information can be used as a basis for raising awareness and planning physical therapy curricula for physical therapy education in order to increase primary prevention activities for improved healthcare.

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## ACKNOWLEDGEMENTS

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# CHAPTER 1

# INTRODUCTION

## Overview

Physical therapy (PT) has traditionally been a hands-on, tertiary-care field. Physical therapists (PT's) dutifully rehabilitate the wounded and disabled, but perform little "habilitation" and "pre-habilitation," i.e. preparing people to prevent problems from happening in the first place. Health dollars pay physical therapists to treat the sick, injured, and disabled, not to keep people well (Rothman, 1992, p. xii).

The American Physical Therapy Association (APTA) 1994 Statement On Health Care Reform asserts: "The concept of disease or injury prevention must be broadened. Both a healthy society and significant cost savings will be the result..." The APTA believes "that physical therapists are uniquely qualified to assume leadership positions in efforts to prevent injury and disability..." (APTA, 1993b). A British physical therapy journal reported, "The physiotherapist of the future will surely be an enabler, an educator, and above all a preventer." (Hayne, 1988, p.3). Physical therapists' efforts to educate, increase consciousness and prevent problems requiring treatment could prove to be a win-win situation. In addition to improving the public health, preventive physical therapy would raise awareness for services provided by physical therapists and increase the profile of the profession. This would increase demand for service (Leathley & Stone, 1986). Physical therapists could train and consult with networks of interested non-therapists who would improve musculoskeletal health of the population in numerous areas. In return, each of these people would become aware of physical therapy services for skilled care and

further information. A more proactive approach to musculoskeletal healthcare would logically include primary preventive care by the same caregivers--physical therapists--who understand and treat the common problems.

## Physical Therapists are Qualified and Needed

Traditional physical therapy curricula prepare therapists for a preventive musculoskeletal role with courses in anatomy and kinesiology, physiology, pathology, evaluation procedures, orthopedic assessment, gait analysis, posture analysis, therapeutic exercise, and health promotion (Loma Linda University School of Allied Health Professions Bulletin,1994-1995; Rothman & Levine, 1992, p. xviii). Physical therapists are well qualified to present scientific information to the public.

Statistical data verifies that physicians, as leaders of the healthcare team, have confidence in the competence of physical therapists to treat musculoskeletal problems. Akpala, Curran, and Simpson (1988) reported that 94% of all diagnostic conditions referred by physicians to physical therapy were disorders of the musculoskeletal system, with an average physician referral rate of 22 per 1000 patient visits.

One key to incorporating prevention into physical therapy is to stimulate the desire of physical therapists themselves to expand their profession in this direction. Hands-on care has long been taught, practiced and reimbursed but primary preventive care has not. The concept of individualized treatment has been synonymous with the practice of physical therapy; a physical therapy patient expected appropriate treatment, individual instruction, and a customized home program. If the patient had wanted preventive

information so he could avoid his injury--he must wait until injured or be fortunate enough to have a physical therapist personal friend!

In Western Europe, served by centralized health care, the need for physical therapy prevention has emerged (Hayne, 1988; Leathley, 1988; Lyne, 1986; Meier-Baumgartner, 1982; Moshkov, 1984; Norton, 1986; Schule, 1981) despite a U. S. public health expert's observation that "without economic benefits to one's practice, the educational imperative becomes less critical" (Curry, 1986, p. 344).

## Why not more Physical Therapy Prevention?

Numerous problems exist in presenting physical therapy primary prevention to the public. Mass media affects public awareness and focuses on the sick or abnormal for the sake of drama, not on healthy, happy people. Traditional use of the medical model by physical therapists (Burkitt, 1986; Skully & Barnes, 1989), cost and lack of reimbursement (APTA, 1993a; U. S. Department of Health and Human Services, 1993), lack of efficacy (Ferrier, 1990; U. S. Department of Health and Human Services, 1993) and manpower shortages (APTA, 1990, May; Davis, 1988) all contribute to the lack of primary prevention. Such factors cannot be adequately addressed until the philosophical basis of our national healthcare system wholeheartedly embraces primary prevention. In physical therapy as well as other fields, public consciousness raising and attitude changes must occur.

Although there is a lack of published research regarding physical therapy student attitudes toward the topic of primary prevention, academic institutions have a powerful influence upon attitudes of physical therapy graduates. Many physical therapists may

never develop a proactive philosophy with prevention as an important component. Some good physical therapy prevention articles do appear in the literature (see examples discussed below), but the decades of successful physical therapy hands-on care may actually inhibit change. Physical therapy educational institutions can boost awareness in physical therapy primary prevention by creating positive attitudes in new graduates before they step into the field. The aim of a preventive physical therapy approach in our nation would be to reach more people with limited government and other third party healthcare dollars.

## The Model Used in This Study

The theoretical model used in this study is Icek Ajzen's Theory of Planned Behavior (Ajzen, 1988, p. 133; see Figure 1). The Theory of Reasoned Action (Ajzen & Fishbein, 1980), a well-known precursor of Ajzen's Theory of Planned Behavior, postulated that behavior is predicted by intention. Intention is a function of two basic determinants, attitude toward the behavior and subjective norm. Ajzen has added a third determinant, perceived behavioral control, as a predictor of intention. In other words, people behave as they intend to behave. Intention is determined by attitudes, the subjective norm (perception of what others want them to do), and perceived ability to control the behavior. These three determinants of intention (attitudes, subjective norm, and perceived control) are determined by a person's beliefs about each one. Attitude results from beliefs about the outcome and evaluation of the outcome (good or bad). Subjective norm results from perception of others desiring them to perform the behavior and how much they want to comply with others' desires (not at all or very much).

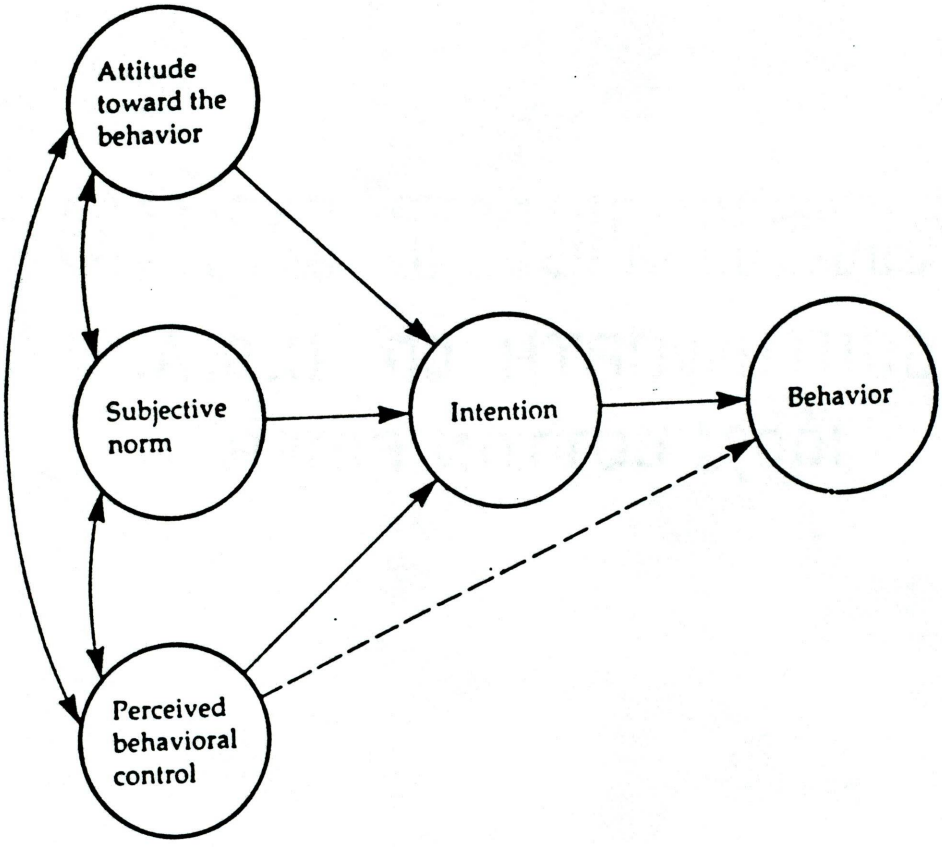


Figure 1. Theory of Planned Behavior.

Perceived control results from beliefs about the availability of resources and the importance of those resources (unimportant or important).

## Purpose

The purpose of this project was to determine physical therapy student attitudes toward primary prevention. The questionnaire, based on the Theory of Planned Behavior by Ajzen (1988), was tested by administrating it to five successive masters of physical therapy (MPT) classes (juniors, seniors, masters, graduates, and advanced masters) at Loma Linda University's School of Allied Health Professions. The questionnaire was tested by the pretest process. Recent graduates as well as the new advanced masters class of clinically experienced physical therapists were included. Statistical analysis utilized hierarchical multiple regression and factor analysis to determine which elements in the Theory of Planned Behavior most strongly predicted intentions to perform preventive physical therapy. Such information will be valuable not only for prediction but also serves as a basis raising awareness, modifying attitudes, and curriculum planning.

## Definition of Terms

Terms which appear in this paper are defined as follows:

1) Primary prevention--health promotion and education for healthy people to keep them healthy and prevent initial sickness or injury

2) Secondary prevention--screening and educational interventions after early signs of disease

3) Tertiary prevention--education of people who are sick, with efforts to bring them back to health or minimize the effects of disease (Rothman & Levine, 1992).

4) Tertiary care--any healing or curative healthcare measures for the sick or injured

# CHAPTER 2

# LITERATURE REVIEW

## Medical Historical Setting

Although Chinese practiced preventive health with acupuncture as early as 2500 BC (P. Yuen, lecture May 23, 1994), and many developing countries practice prevention today because they have no access to "cures" (M.A.C. Franksen, personal communication, August 25, 1994), the U.S. has moved away from prevention to tertiary care. This happened with good reason. Infectious diseases in 1900 were a leading cause of death--influenza, pneumonia, diphtheria, tuberculosis, and gastrointestinal infection. Before the turn of the century "black death" (bubonic plague) in Europe caused 150,00 deaths in London alone and 50 million deaths worldwide during the Middle Ages (Parran, 1978; Smith, 1978).

The U.S. never experienced extensive killer plagues because scientists discovered microbes and successfully vaccinated and decontaminated its populations at risk (Parran, 1978). Such success in preventive public health efforts encouraged people to depend upon science and technology. Following the Flexner Report in 1910 (Gaumer, 1984) medical science improved the care provided by physicians and hospitals. World War I demonstrated the competence of physicians in emergency care, and during World War II the miracles of penicillin and sulfa drugs reaffirmed the public trust in medical doctors for tertiary care (Joyce Hopp, personal communication, March 24, 1995). A dependence upon the medical model and tertiary care naturally followed.

Today, however, morbidity and mortality rates have changed. With the exception of the AIDS epidemic, infectious diseases requiring the intervention of skilled professionals are no longer major causes of death. Statistics reported in 1987 listed infectious disease as only one of the top ten causes of death (number six, pneumonia and influenza), with 3.2% of mortality (U. S. Department of Health and Human Services, 1988, p.4). This late 20th century change in cause of death (Bunker, 1986; Curry, 1986) shows that lifestyle diseases now produce 50% of all deaths and 90% of all health problems. The diseases which kill people today--heart disease, strokes, cancer and lung disease--are largely preventable by the individual at risk and not by the healthcare practitioner (Robinson, 1984). The key to personal individual health is now more than ever prevention.

Health educators have realized for years that individuals must accept more responsibility for their own health (Nyswander, 1951; Allport, 1958; Derryberry, 1960; Griffiths, 1972; and others cited in Simonds, 1982. Also Green, 1979; Hayne, 1988). The U. S. Department of Health and Human Services has recently expressed concern for "keeping people healthy" (Elders, 1994) and launched a "Put Prevention into Practice" campaign, creating the 400-page text Clinician's Handbook of Preventive Services ("Government Launches," 1994). The Pew Commission states that all health caregivers should practice "a general shift from care to cure" indicating need for a more preventive official stance (Shugars, O'Neil, & Bader, 1991). Physical therapy's own official organization, the APTA, suggests in its 1994 Statement on Health Care Reform that physical therapists broaden physical therapy perspectives; in view of recent government

health statements this pronouncement is indeed well-timed and may have fuller meaning than many physical therapists realize.

## Pertinent Physical Therapy History

Physical therapy emerged as an occupation in the United States during World War I when female "Reconstruction Aides" treated injured soldiers to help maintain a viable military force (Skully & Barnes, 1989). This occurred at the same time physicians were improving their skills and the use of scientific technology to save lives. Working with physicians in a medical model, physical therapists flourished in rehabilitating the sick and injured. Over the years physical therapy has grown in scientific expertise and expanded to include specialties in Cardiopulmonary Physical Therapy, Clinical Electrophysiologic Physical Therapy, Geriatric Physical Therapy, Neurologic Physical Therapy, Orthopedic Physical Therapy, Pediatric Physical Therapy, and Sports Physical Therapy (APTA, 1992). Most physical therapy practice, though, remains as hands-on tertiary care.

## Allied Health Influence on Physical Therapy

Physical therapy is an allied health profession. The allied health field exhibits few articles on health promotion and prevention, exerts a limited sphere of influence (Bunker, 1986; Douglas, 1986), and member professions often remain anonymous and unrecognized (Curry, 1986; Willis, 1986). One organization, The American Society of Allied Health Professionals (now called The Association of Schools of Allied Health Professions [O'Neil, 1993]) attempted to organize and unify the different groups but has enjoyed limited success. Member groups lack common objectives and struggle for turf, weakening their common voice in both medical and public arenas (Willis, 1986).

Although poorly supported, The American Society of Allied Health Professionals successfully obtained nine federal grants and added allied health to the U. S. Task Force on Preventive Services. The various professions also played major roles in a series of national workshops sponsored by the Bureau of Health Professions for allied health in the 1980's (Curry, 1986). The workshops considered the effect of health promotion and disease prevention efforts in the area of education for health professionals. Several of the allied health groups began to evaluate their position in health promotion and disease prevention and some even produced official position papers. Initiatives by individuals, educational institutions and professional associations reinforced allied health's role in the health promotion movement.

Physical therapists began to look beyond their immediate settings of tertiary care as evidenced by publication of informational back care articles as well as slides, videos and educational materials offered by vendors. Still the interactive coordination and networking among various allied health professions needed to produce significant accomplishments did not occur. Despite some achievements, a myriad of additional gains is possible, for allied health remains "in a state of potential" (Willis, 1986).

C. R. Willis (1986), dean of the College of Health and Human Services at Bowling Green State University, Ohio, believes that the ASAHP should take a leadership role in the development of "Objectives for the 21st Century." With clearly stated objectives and roles, educational institutions and individuals could become involved in every hospital, school and community in the nation. He believes "wellness" can become a reality only if third-party payors recognize and prioritize it for reimbursement.

## Preventive European Literature

Western European literature indicates a strong interest in prevention for physical therapists and other health professionals (Hayne, 1988; Leathley & Stone, 1986; Leathley, 1988; Lyne 1986; Lyne & Phillipson, 1986; Meier-Baumgartner, 1982; Moshkov, 1984; Norton, 1986; Robinson, 1986; Schule, 1981; Shore, 1986). Since third party payors have long reimbursed for preventive treatment at European spas, German and Russian abstracts discuss "present-day concepts for preventive...treatment in the health resort clinics" and "preventive rehabilitation of the outpatient with the aim of slowing down, possibly even stabilizing or retarding...the aging process" (Meier-Baumgartner, 1982; Moshkov, 1984; Schule, 1981). Authors from Great Britain (below) describe the need for more prevention in "physiotherapy." Perhaps the years of centralized health care in Europe delineated patients' needs for preventive services, or prevention may have emerged as a strategy for maximum efficiency and economy. In 1983 the Health Education Council of Great Britain commissioned studies on health education in four "professions allied to medicine" (PAM's). These studies at Sheffield City Polytechnic, which surveyed physical therapy, chiropody, dietetics, and occupational therapy, investigated the extent to which the four fields embraced health education as being part of their practice (Leathley, 1986, 1988; Lyne, 1986). The research revealed that PAM's possessed revealing insights into the everyday lives of their patients. Most health caregivers saw patients only while they are sick, but PAM's often saw them during normal activities of daily living, enabling them to view real-life relationships between people and their environments (Lyne, 1986).

Physical therapists in the survey exhibited interest in health education (Leathley, 1988). Areas most often mentioned were back care and ante/post-natal education. Other areas mentioned were education for elderly, cardiac conditions, stress control, asthmatic or handicapped children, help for health carers or staff, joint protection, incontinence, and chronic conditions. The physical therapists expressed concern for reaching their clients sooner in order to address many problems which might have been prevented (Lyne, 1986) and felt that "a specific physical therapy post with a responsibility for health education would be useful" (Leathley, 1988, p. 220). The ideas conceptualized from the Sheffield study concurred with a World Health Organization statement in 1984: "Health promotion involves the population as a whole in the context of its everyday life, rather than focusing on people at risk for specific diseases" (WHO, 1984).

British physical therapists indicated their interest in health promotion and disease prevention with an issue of Physiotherapy (January, 1986) specifically focused upon prevention. Numerous articles related the thinking of physiotherapists and other health professionals about the need for more proactive physical therapy involvement.

## Lack of Physical Therapy Prevention

Physical therapists as well as others have recognized that preventive physical therapy is needed by many people. Fitness columnist Kathleen Doheny aptly stated this idea in the Los Angeles Times Mirror:

> "Sports stars discovered it first: The more you use physical therapy as preventive maintenance, the less time you'll rack up in rehab.
>
> "This new approach to physical therapy has such a common-sense

premise--identify weak muscles and build them up before they rip or strain--that everyone wonders what took so long.

> "Preventive physical therapy is gaining favor with professional and amateur athletes as well as adults who switch or start exercise routines (March 8, 1994, p. E-2)."

A health professional workshop held in Williamsburg, Virginia in April, 1986, involved thoughts from many fields about prevention. Physical therapists presented information on areas of preventive physical therapy interest (May, 1986) and also discussed wellness (Gibbons, 1986). A true "broadening" appeared imminent...yet it never actually occurred.

Drastic financial changes for hospitals in the late 1980's concentrated physical therapists in tertiary care work in order to assist hospital reimbursement. Since that time, although the APTA often mentions prevention, U.S. physical therapists seem focused on patient care, expanded networking, and reimbursement issues in clinical settings (Physical Therapy 2010, 1993).

Attitudes of the healthcare system, the public, and individual awareness all create the present picture of hands-on-only care by physical therapists . Here are some of the compelling reasons:

1) Traditional adherence to the medical model (Burkitt, 1986; Skully & Barnes, 1989). The tertiary-care concept in modern medicine is much the same as physical therapy.

2) Cost and reimbursement. Hands-on physical therapy is well reimbursed while prevention is usually not reimbursed. Physical therapists involved in prevention often do so under the category of pro bono physical therapy as encouraged by the APTA (APTA, 1993a). The third-party cost of payment for prevention requires outcome assessment (U. S. Department of Health and Human Services, 1993), and little exists.

3) Lack of outcome assessment and proven efficacy (Ferrier, 1990; Lyne, 1986; U. S. Department of Health and Human Services, 1993). A strictly clinical approach to "make people better" seldom included scientific research to measure outcomes. Nor do bachelor's level physical therapists have research skills or facilities to produce such data.

4) A manpower shortage. More job openings exist in clinical settings than physical therapists to fill them (APTA, 1990, May; Davis, 1988; Mayer, 1987; Russell, 1990); APTA president Marilyn Moffat states that "by the year 2000, the demand for physical therapists is expected to exceed the supply by 23,000 physical therapists ("President's Perspective," 1991, p. 3). British physical therapists listed "overwhelming work" as a problem preventing physical therapy health education in the Sheffield survey (Leathley, 1988).

5) Patient compliance (Sluijs, 1991). Patients might not comply with instructions without painful symptoms as a motivator.

6) Proprietary interests, competition, and identity issues (Ferrier, 1990; O'Neil, 1993; Willis, 1986). Turf-protection and diverse interests limits cooperation by member professions in allied health. Physical therapists may wish to keep certain valuable information secret.

7) Physical therapy is currently transitioning from occupation to profession (Lyne & Phillipson, 1986). Primary prevention activities including health education have not been accorded high status in medicine, and a lack of role definition or standards of practice still exists in physical therapy.

8) Family and other priorities. Physical therapy began as a woman's field (Skully & Barnes, 1989;), and has always contained more women than men. Women sometimes wish to work only part-time or work an 8-to-5, 5-day-a-week job. They might not desire to teach groups or work for free.

9) Exploitation. Organizations which employ physical therapists collect fees in excess of the physical therapists' salaries. In past years reimbursement for physical therapy services climbed to far exceed the salary paid to the physical therapists, therefore in many situations the physical therapists are being exploited. This situation has placed physical therapy services in high demand by hospitals, clinics, and physicians in order to boost cash flow.

It is no surprise that non- physical therapists have authored excellent articles on prevention in areas treated hands-on by physical therapists . Some examples are education/exercises to prevent low back injury (Brown, Sirles, Hilyer, & Thomas, 1992; Leonard, 1990), the promotion of general physical activity (Iverson, Fielding, Crow, &

Christianson, 1985), exercise programs for arthritis patients (Boulware & Byrd, 1993), work site health promotion to reduce absenteeism (Jones, Bly, & Richardson, 1990), burn prevention (Cook & Zeanah, 1982), and spinal cord injury prevention (Shaw, McMahon, & Bruce, 1984).

## Clinical Programs in Prevention

A 515-page text, co-authored in 1992 by physical therapist Jeffrey Rothman EdD, and occupational therapist Ruth Levine EdD, is titled Prevention Practice: Strategies for Physical Therapy and Occupational Therapy. The well-documented book addresses four major areas including 1) promoting a health lifestyle, 2) prevention and treatment strategies for specific problems, 3) workplace and environment, and 4) issues for the therapist and educator. The number of primary preventive programs in physical therapy literature appears to be increasing. Clinical literature (more than peer review journals) contains examples of preventive programs. Back schools and back education have long been accepted areas for physical therapy primary prevention (Chenoweth, 1983; Liemohn, Snodgrass & Sharpe, 1988; Linton & Kamwendo, 1987; Ryden, Molgaard, & Bobbitt, 1988; Snook, 1987).

Physical therapy in the workplace or industry has become popular in recent years. A new comprehensive text on Industrial Therapy (Key, 1995) discusses primary prevention as well as screening and treatment for workers. One entire issue of APTA's Clinical Management (September-October, 1990) focused upon physical therapy in the workplace (Twelves; Gee; McReynolds; Hebert; Altug, Hoffman, Slane, Farabaugh, Truschel, & Bemesderfer). Other related articles include authors Acly, 1994; Benner,

1994; Brecker, 1994a; Brecker, 1994b; Lear & Pomeroy, 1994 May and October; and Murphy, 1994a & 1994c. Physical therapists have worked as consultants, educators, exercise leaders, or program directors to industry for injury prevention (Huhn & Volski, 1985; Kleven, 1982; Volski, 1982). Some articles have addressed reimbursement issues (Hicks, 1986; Lepore, Olson, & Tomer, 1984), and clinical journals offer continuing education by knowledgeable industrial therapists (e.g. K. Blankenship, S. Isernhagen, G. Gimbel) as well as materials including work stations (Clinical Management, September-October, 1990), videos (e.g. OPTP, PT Forum, October 14, 1994), and other educational tools from market vendors (e.g. The Saunders Group, Inc.).

"Fitness and The Year 2000" (Francis, 1992) discusses exercise from a broad public health perspective. Other fitness authors include Altug & Miller, 1989; Reynolds, 1993; and Wood, 1989. A quote about the need for therapists in health clubs describes a person who started to exercise without physical therapy planning:

> "I have been working out at the club for a month, now, but it's not going very well. I'm really discouraged. I haven't lost any weight, I have shin splints, and my back is starting to bother me (Wilmarth, 1987, p. 18)."

Wilmarth declares, "If you cannot intervene at the start to help members plan a graduated program of exercise, you will inevitably see them for injuries at some point down the road (p. 19)."

Physical therapists often help prevent sports injuries (Brecker, 1994b; Colan, 1994a; Colan, 1994b), and an occasional talented physical therapist enters mass media with free public information and entertainment (Ketter, 1994).

Although not defined as primary prevention in the strictest sense, exercise prescriptions may target patient groups or special populations at risk for predictable injuries such as geriatrics (Lewis & Dillon, 1995; Murphy, 1994b), general fitness/wellness ("Physical Therapy Topics", 1993), and arthritis (Minor, Hewett, Webel, Anderson, & Kay, 1989; Newcomer & Jurisson, 1994). Other patient groups include chronic pain, spinal cord injury, pediatric disabled, and individuals under stress (Rothman & Levine, 1992).

## The Pew Commission

Voters and taxpayers realize that all has not been well for some time with the U.S. healthcare system, and efforts to remedy its woes have been addressed by the government. The education of health professionals has been cited as a problem source. Healthy America: Practitioners for 2005, a report for the U. S. government made by the Pew Commission in 1991, indicated that "the education and training of health professionals is out of step with the evolving health needs of the American people" (Shugars et al., p. iii). "Strategies for Change" states that health practitioners should practice prevention and promote healthy lifestyles, and that "the public should embrace the wellness philosophy in both personal lifestyles and through private and public health promotion initiatives" (p. 25). A survey by the Commission reported that while 53% of physicians indicated they received excellent training in treating disease, only 16% believed their training to be

excellent in preventing disease (p. 97). Physical therapists, as allied health professionals, usually practice by physician prescription, so it is no surprise that prevention is not often a priority in physical therapy.

A subsequent Pew Commission report in 1993 (O'Neil) outlined needed changes in educational curricula for health professionals, stating "the skills, attitudes, and values of the nations's 10 million health care workers have a fundamental impact on health care" ( p. 5). The report further declared, "The evolving nature of our health care system will require health professionals with different skills, attitudes, and values", requiring "adjustments in the role of allied health workers...in their relationship with patients and the scope of their practice..." (p. 7).

The Commission hopes to see allied health integrate and collaborate in order to improve health services. A summary of goals for integration in allied health from the 1993 Pew Commission report Health Professions Education for the Future: Schools in Service to the Nation (O'Neil) lists six strategies. A primary prevention focus would cooperate with the stated strategies to unify and improve linkages in parts of allied health, validate clinical practice, and utilize allied health workers in new ways.

## Student Attitudes

If the physical therapy profession wishes to change attitudes toward primary prevention, new therapists entering the field must become more aware of it; students in physical therapy education institutions should have health promotion and disease prevention included as part of their program (Leathley, 1988; Norton, 1986). Physical therapy students' attitudes toward prevention have not been examined in current literature,

nor has scrutiny been focused upon the attitudinal effects of an entire physical therapy curriculum. Several healthcare disciplines, however, have published articles about change in student attitudes following various educational interventions.

Medical and nursing students showed conflicting results about attitudes toward health promotion and preventive medicine. A study of nursing students found that they actually discussed the value of health promotion more frequently when they entered the program than when they finished (Donoghue, Duffield, Pelletier, & Adams, 1990), but in a Kentucky medical school survey, students' knowledge and attitudes of preventive medicine ideals became more positive as they progressed through professional school (Phillips, Rubeck, Hathaway, Becker, & Boehlecke, 1993). Results of a preventive cardiology curriculum showed insignificant changes in student attitudes as a result of the program (Dismuke & McClary, 1990). A German abstract discloses that following a medical curriculum personal smoking habits did not change although medical students improved in all cognitive areas of their education (Gillmann-Blum, 1989).

Most research of student attitudes indicates positive change following a specific course or learning experience in a curriculum. Improved student attitudes were reported towards AIDS/HIV (Alteneder, Price, Telljohann, Didion, & Locher, 1992; Brown, Calder, & Rae, 1990; Muskin & Stevens, 1990; Strauss, Corless, Luckey, van der Horst, & Dennis, 1992); cancer (Krackov, Preston & Rubin, 1990; Torabi & Seffrin, 1989); cardiology (Kashani et al., 1993); death and dying (Hurtig & Stewin, 1990; Kaye, 1991); the disabled (Lindgren & Oermann, 1993); geriatrics (Adelman, Fields, & Jutagir, 1992; Brown, Gardner, Perritt, & Kelly, 1992; Rumsey, 1993; Sainsbury, Wilkinson, & Smith,

1992; Tarbox, Connors, & Faillance, 1987); mental illness (Bairan & Farnsworth, 1989; Drolen, 1993; Malla & Shaw, 1987; Slimmer, Wendt, Martinkus, 1990); and obesity (Wiese, Wilson, Jones, & Neises, 1992).

Factors in addition to professional curriculum exposure may influence student attitudes. These include an interaction of both classwork and clinical experience (Wilson, Brockopp, Kryst, Sieger, & Witt, 1992), family backgrounds (Jack, 1989), and peers (Sloan & Zimmer, 1993), while certain personal characteristics of health professionals may not change regardless of the curriculum (Feldman & Crook, 1984). The amount of time in professional school may adversely affect attitudes. Dental students, studied for four years, became less diligent, cheated more on exams and developed more negative attitudes toward school and faculty during training (Lancaster, Gardiner, Strother, & Boozer, 1989), while medical students' programs rendered them generally more cynical (Kopelman, 1983).

# CHAPTER 3

# METHODS

## Research Design

Azjen's Theory of Planned Behavior (1988) was used to create an instrument for assessing physical therapy student attitudes. Survey questions were used to create variables for statistical analysis based on the theory (Ajzen, 1988).

## Questionnaire Development

This study entailed several basic steps as follows:

1) Determination of Primary Prevention Beliefs. Beliefs about primary prevention in physical therapy were determined by interviewing 4-6 physical therapy students from each class in the Loma Linda University masters in physical therapy program (transfer students, juniors, seniors, masters level,) as well as several experienced physical therapists . Open-ended questions concerning beliefs about attitudes, subjective norms, and perceived behavioral control requested respondents to write as many responses as possible.

2) Questionnaire development. I developed the questionnaire utilizing information from the student interview responses and theory variables. The questionnaire measured intention toward performing the behavior, attitude toward the behavior, subjective norm toward the behavior, perceived control of the behavior, and the outcome, normative, and control beliefs that predict these variables. On 7-to- 9-point scales the respondents circled

positive or negative answers to express strength of persuasion. Demographic data were collected from all student participants.

3) Pre-test. The initial survey questionnaire was pre-tested on a physical therapy transfer student class of 22 students. This illuminated potential problems in the questions and improved survey design before the questionnaire was actually used.

4) Administration of questionnaire. After scrutiny and needed changes to clarify meanings, the questionnaire was administered in person or by mail to the junior, senior, masters, new graduate and advanced masters physical therapy student classes in order to secure an adequate number of usable questionnaires. A minimum of 131 questionnaires required analysis in order to achieve adequate power for testing the questionnaire; 266 questionnaires were actually returned. Return from the junior physical therapy class was 86.4%, senior class 80.5%, masters 92.5%, new graduate class 74%, and advanced masters 80.0%. Correlations between variables as well as predictive relationships were established following analysis of this information.

## Statistical Analysis

Statistical analysis used the SPSS/PC. Chi square and one-way ANOVA tests were run on demographic variables to determine if the classes were significantly different from each other. Means were determined for measures of intention, attitude, subjective norm, and control. Hierarchical multiple regression was used to determine which elements

in the Theory of Planned Behavior most strongly predicted intentions to perform preventive physical therapy. Before the regression was performed, a single score for each outcome belief was obtained by multiplying likelihood of the outcome belief (scale of 0 to 7) by evaluation of goodness of the belief (scale of -3.5 to +3.5). The latter scale was obtained by subtracting 3.5 from the original scale of 0 to 7 to set the neutral response between bad and good to zero. A single score for subjective norm beliefs was obtained by multiplying the influence of others factor by the desire to comply factor. A single score for control beliefs was obtained by multiplying availability of controlling factors by importance of the factors. Each of these scales was 0 to 7. Factor analysis grouped the related factors together to further analyze the data.

Based on Cohen's 1977 power tables, power for this research is > 94% ($\alpha$ at .05) for moderate effect based on the actual number of variables (19) and actual sample size (266) for what Cohen calls medium effect size.

# CHAPTER 4

# RESULTS

## Overview

The questionnaire was administered to all five masters classes at Loma Linda University department of physical therapy, a section of the School of Allied Health Professions. Three regular masters classes were currently in progress; new juniors, seniors, and masters level students. Recent graduates, dispersed to many locations, were also included in the survey. The advanced masters class, which meets two nights a week, is a unique group of physical therapists who work during the day and wish to upgrade their physical therapy bachelor's degrees. These individuals were older and generally more experienced than those in the other four groups.

## Demographics

Results of the survey revealed no significant differences among the five classes for gender, race, citizenship, country of origin, previous occupations or degrees, other work experience in a medical field, or time in other medical work experience. Physical therapy assistants did not differ in these variables from those who were not. No significant differences existed for years of college (mean average 3.56 years, SD 1.55), physical therapy work experience before entering the program, or job during the junior year. There was no significant difference in respondents' perceptions of physical therapy as a "hands-on" profession. See Table 1 for demographics of the sample.

Table 1
Demographic Characteristics of the Sample

| Variable | % | n |
|---|---|---|
| Gender | | |
| Male | 44.3 | 117 |
| Female | 55.7 | 147 |
| Age in years | | |
| 25 or less | 57.5 | 153 |
| 26-30 | 18.4 | 49 |
| 31-35 | 9.8 | 26 |
| 36-40 | 9.8 | 26 |
| >40 | 4.5 | 12 |
| Race | | |
| Caucasian | 70.8 | 187 |
| Oriental | 15.4 | 41 |
| Hispanic | 8.3 | 22 |
| Black | 1.5 | 4 |
| Other | 3.8 | 10 |
| Citizenship | | |
| U. S. | 87.5 | 232 |
| Other | 12.6 | 33 |
| PT Assistant licensure | 9.1 | 24 |
| Students listing other occupations or degrees | 30.8 | 82 |
| Years of college before entering physical therapy masters program | | |
| 2 | 24.5 | 64 |
| 2.5 - 3.5 | 31.1 | 81 |
| 4 | 22.6 | 59 |
| >4 | 21.5 | 56 |

A significant response difference appeared in age of respondents, job during the senior year of school, job during the masters year of school, and in familiarity with the concept of preventive physical therapy.

The statistically significant difference in age between classes disappeared with deletion of the advanced master's class (those who return two nights a week to upgrade a 4-year bachelors degree while working regular daytime jobs). An over-30 age category was created to include the three older age categories (31-35, 36-40, and >40) in order to satisfy chi-square test assumptions. With this combination there was no significant difference in age among the classes, $\chi^2(6, \underline{N} = 198) = 8.97$, $\underline{p} > .05$. Table 2 shows classes by age.

I do not consider all three questions about job experience hours/week during the junior, senior and masters years of school valid for advanced masters respondents or for new junior respondents. For advanced masters students, the years of junior and senior physical therapy education occurred at varying times during past decades. All advanced masters individuals were presently working at least half-time during the day while they attended night classes for the masters degree. Advanced masters responses were eliminated from analysis of this question about difference between classes. For respondents in the new junior class, the senior and masters years of school were still in the future (i.e. 100% of the juniors had not yet worked during their senior or masters years.) Since the survey was given to juniors during the summer session before the regular junior school year began, their responses about work in the junior year would also not be valid. So job hours in the junior year, only the senior, masters and graduate classes' hours

Table 2
Age in Years of Respondents by Class

| Class | 25 or under | | 26 to 30 | | over 30 | |
|---|---|---|---|---|---|---|
| | % | n | % | n | % | n |
| Juniors | 69.3 | 52 | 14.7 | 11 | 16.0 | 12 |
| Seniors | 69.0 | 40 | 10.3 | 6 | 20.7 | 12 |
| Masters | 62.9 | 39 | 24.2 | 15 | 12.9 | 8 |
| Graduates | 51.2 | 22 | 27.9 | 12 | 20.9 | 9 |
| Advanced masters | 0.0 | 0.0 | 17.9 | 5 | 82.1 | 23 |

were calculated. One-way ANOVA tests indicated no significant difference at the .05 level between senior, masters and graduate classes for jobs hours per week in the junior year of school $F(2, 151) = 1.69$, $p = .19$. For job hours in the senior year, the masters and graduate classes' hours were analyzed by one-way ANOVA, and found to be not significantly differently at the .05 level although a trend for difference did exist, $F(1, 100) = 3.65$, $p = .059$.

Although the concept of physical therapy as a "hands-on profession" was not significantly different in various classes, the concept of preventive physical therapy appeared significantly more familiar to students as they progressed through the program ($p = .00001$), with graduates and advanced masters reporting the highest percent of familiarity (see Table 3).

Since there were no statistical differences among the classes on model variables regarding preventive physical therapy, classes were combined for analysis of question responses relating to the Azjen model.

## Response to Individual Items

Individual survey questions on all eighteen outcome beliefs appear in Table 4. They are sorted high-low by means, with standard deviations and number of respondents for each question. The outcome belief with highest likelihood (mean 6.13 for the 0 - 7 scale) according to respondents, is that fewer patients would need physical therapy for acute injuries. Table 5 shows the deviations of goodness/badness for the same questions also rated by respondents high-low by mean. This survey scale which appeared 0 - 7 on the questionnaire was re-calibrated to a -3.5 - +3.5 scale for calculating model predictions.

Table 3
Familiarity with the Concept of Preventive Physical Therapy by Class

| Class | Not familiar | | Somewhat familiar | | Very familiar | |
|---|---|---|---|---|---|---|
| | % | n | % | n | % | n |
| Juniors | 60 | 45 | 27 | 20 | 13 | 10 |
| Seniors | 22 | 13 | 40 | 23 | 38 | 22 |
| Masters | 16 | 10 | 39 | 24 | 45 | 28 |
| Graduate | 2.3 | 1 | 28 | 12 | 70 | 30 |
| Advanced masters | 7.1 | 2 | 21 | 6 | 71 | 20 |

Table 4

Means and Stand. Deviations of Likelihood* for Outcome Beliefs of Doing Preventive Physical Therapy

| Outcomes of doing preventive PT | Mean | SD | n |
|---|---|---|---|
| I would experience personal satisfaction (i.e. helping people) | 6.13 | 1.03 | 264 |
| It would increase general education/awareness | 5.89 | 1.11 | 265 |
| It would help PT compete in the changing healthcare scene | 5.57 | 1.40 | 264 |
| It would create new opportunities for PT's | 5.47 | 1.46 | 265 |
| It would lead to a healthier society, less disability and injury | 5.41 | 1.51 | 264 |
| I could market my PT skills or practice | 5.31 | 1.46 | 265 |
| It would save money for everyone | 5.25 | 1.54 | 265 |
| I would work with healthy people | 5.20 | 1.58 | 264 |
| It would prevent PT problems before they occur | 5.13 | 1.32 | 266 |
| It would market PT as a profession | 5.10 | 1.61 | 264 |
| It would increase productivity of workers | 5.03 | 1.57 | 264 |
| I would present information to large groups | 4.98 | 1.78 | 265 |
| Fewer patients would need PT for acute injuries | 4.57 | 1.64 | 264 |
| I might not be paid for preventive PT | 4.26 | 2.07 | 265 |
| I could do research on preventive PT | 3.98 | 2.21 | 265 |
| It would allow less hands-on care of patients | 3.93 | 1.71 | 263 |
| There would be less jobs for PT's | 2.86 | 1.99 | 265 |
| It would allow less time for my family or myself | 2.38 | 1.89 | 265 |

*Scale 0 to 7 with 0 = unlikely, 7 = likely.

Table 5

Means and Stand. Deviations of Goodness* for Outcome Beliefs for Doing Preventive Physical Therapy

| How bad or good perceived outcomes of doing preventive PT | Mean | SD | n |
|---|---|---|---|
| I would experience personal satisfaction (i.e. helping people | 2.58 | 1.18 | 265 |
| It would create new opportunities for PT's | 2.33 | 1.36 | 262 |
| It would increase general education/awareness | 2.31 | 1.34 | 263 |
| It would lead to a healthier society, less disability and injury | 2.20 | 1.60 | 263 |
| I could market my PT skills or practice | 2.14 | 1.41 | 262 |
| It would help PT compete in the changing healthcare scene | 2.11 | 1.45 | 262 |
| It would market PT as a profession | 1.99 | 1.52 | 263 |
| I would work with healthy people | 1.98 | 1.43 | 260 |
| It would increase productivity of workers | 1.84 | 1.58 | 262 |
| It would prevent PT problems before they occur | 1.65 | 1.64 | 261 |
| It would save money for everyone | 1.56 | 1.70 | 264 |
| I would present information to large groups | 1.23 | 1.83 | 262 |
| Fewer patients would need PT for acute injuries | 1.18 | 1.74 | 264 |
| I could do research on preventive PT | 0.87 | 2.00 | 263 |
| It would allow less hands-on care of patients | -0.02 | 1.82 | 262 |
| I might not be paid for preventive PT | -1.38 | 1.99 | 263 |
| It would allow less time for my family or myself | -1.53 | 2.05 | 263 |
| There would be less jobs for PT's | -1.55 | 1.89 | 263 |

*Scale -3.5 to +3.5, with -3.5 = bad, +3.5 = good.

The highest mean for Table 5 (2.58) represented the outcome belief of experiencing personal satisfaction (i.e. helping people). A simple correlation of all the Table 4 means (likelihood of outcomes) with all Table 5 means (how good/bad) produced an r of .92), showing that respondents believe that the outcomes likely to occur are good.

Table 6 shows the fifteen referent beliefs--persons or groups who might or might not want you to do preventive physical therapy. The highest mean for this 0 - 7 scale, 5.89, indicated that respondents believed patients' families would most "want you to do preventive physical therapy." For Table 7, the highest mean was 6.13 on the 0 - 7 scale for strong desire to comply with the physical therapist's own personal family wishes.

Control beliefs appear in Table 8. The 0 - 7 scale demonstrates a high mean of 5.43 for the concept that physical therapists do possess adequate personal skills (verbal or others) available to do preventive physical therapy. Table 9 displays the same exact concept (personal skills) perceived as the most important for doing preventive physical therapy (mean 6.15 on 0 - 7 scale).

## Other Written-in Responses for Beliefs

Respondents were asked to write in other outcome, referent, and control beliefs after circling answers to all questions on the 0 - 7 scales. Most of the write-ins actually repeated questions which were included in the questionnaire. The write-in responses were categorized for computerized analysis, although the response rate was low. Highest response rates came from masters students on all three items, while the lowest response rates came from advanced masters students (see Tables 10, 11, and 12).

Table 6

Means and Standard Deviations of Opinions of Individuals or Groups* Regarding My Doing Preventive Physical Therapy

| How much does this group want you to do preventive PT | Mean | SD | n |
|---|---|---|---|
| Patients' family(ies) | 5.89 | 1.27 | 257 |
| Patients' employers | 5.71 | 1.57 | 243 |
| Your family | 5.65 | 1.43 | 250 |
| Fitness people (i.e. health clubs) | 5.50 | 1.73 | 255 |
| Target groups, people you teach | 5.47 | 1.31 | 249 |
| Schools | 5.46 | 1.49 | 253 |
| The public | 5.13 | 1.37 | 254 |
| Other PT's | 4.97 | 1.44 | 248 |
| Insurance companies | 4.86 | 2.25 | 258 |
| Your employer | 4.85 | 1.62 | 220 |
| Government | 4.79 | 1.95 | 244 |
| Other health professionals | 4.76 | 1.51 | 248 |
| Hospitals | 4.70 | 1.86 | 250 |
| Physicians | 4.21 | 1.82 | 254 |
| Chiropractors | 2.63 | 2.17 | 234 |

*Scale 0 to 7, 0 = not at all, 7 = very much

Table 7

Means and Standard Deviations of My Desire to Comply* with Desires of Others Regarding My Doing Preventive Physical Therapy

| Strength of desire to comply with this person or group | Mean | SD | n |
|---|---|---|---|
| Your family | 6.13 | 1.20 | 266 |
| Patients' families | 5.87 | 1.22 | 247 |
| Target groups, people you teach | 5.74 | 1.24 | 251 |
| Schools | 5.43 | 1.40 | 243 |
| Your employer | 5.40 | 1.41 | 222 |
| The public | 5.37 | 1.36 | 247 |
| Other PT's | 5.16 | 1.47 | 245 |
| Patients' employers | 5.09 | 1.57 | 237 |
| Fitness people (i.e. health clubs) | 5.08 | 1.79 | 247 |
| Other health professionals | 5.01 | 1.45 | 244 |
| Hospitals | 4.98 | 1.64 | 245 |
| Physicians | 4.83 | 1.63 | 249 |
| Insurance companies | 4.49 | 2.02 | 249 |
| Government | 4.20 | 1.91 | 239 |
| Chiropractors | 2.63 | 2.31 | 228 |

*Scale 0 to 7, 0 = not at all, 7 = very much.

Table 8

Means and Standard Deviations of Availability* of Factors Controlling My Doing Preventive Physical Therapy

| Factors which enable me to do preventive PT | Mean | SD | n |
|---|---|---|---|
| Adequate PT personal skills (i.e. verbal, others) | 5.43 | 1.37 | 266 |
| Acknowledgment/support from other PT's | 5.00 | 1.43 | 262 |
| Space/environment for teaching | 4.63 | 1.52 | 262 |
| An unfulfilled need for preventive PT | 4.59 | 1.69 | 262 |
| Understanding the target group well | 4.56 | 1.58 | 262 |
| Educational materials (videos, books etc) | 4.55 | 1.55 | 262 |
| Positive public attitudes | 4.55 | 1.49 | 262 |
| Acknowledgment/support from other health professionals | 4.53 | 1.48 | 261 |
| Advertising for my preventive PT interventions | 4.30 | 1.74 | 261 |
| Help from volunteers or co-workers | 4.23 | 1.60 | 262 |
| Legal advice if needed | 4.05 | 1.79 | 261 |
| Invitations to do preventive PT | 4.01 | 1.59 | 262 |
| Research/journal information | 3.99 | 1.69 | 261 |
| Acknowledgment/support from MD's | 3.98 | 1.56 | 263 |
| Healthy clients motivated to do preventive PT | 3.86 | 1.58 | 263 |
| Time to do preventive PT | 3.70 | 1.81 | 261 |
| Acknowledgment/funds from HMO's | 3.30 | 1.96 | 262 |
| Acknowledgment/funds from insurance | 3.22 | 1.98 | 263 |
| Acknowledgment/funds from government | 3.07 | 1.79 | 263 |

*Scale 0 to 7, 0 = not at all, 7 = very available.

Table 9

Means and Standard Deviations of Importance* of Factors Controlling My Doing Preventive Physical Therapy

| Importance of this factor for doing preventive PT | Mean | SD | n |
|---|---|---|---|
| Adequate personal skills (i.e. verbal, others) | 6.15 | 1.16 | 260 |
| Time to do preventive PT | 5.95 | 1.21 | 259 |
| Healthy clients motivated to do preventive PT | 5.94 | 1.45 | 261 |
| Positive public attitudes | 5.92 | 1.25 | 261 |
| Space/environment for teaching | 5.80 | 1.20 | 261 |
| Understanding the target group well | 5.78 | 1.37 | 261 |
| Educational materials (videos, books etc) | 5.77 | 1.27 | 261 |
| Acknowledgment/funds from insurance | 5.72 | 1.60 | 262 |
| Acknowledgment/funds from HMO's | 5.59 | 1.58 | 261 |
| Acknowledgment/support from MD's | 5.48 | 1.56 | 262 |
| Invitations to do preventive PT | 5.47 | 1.42 | 261 |
| Research/journal information | 5.37 | 1.48 | 260 |
| Help from volunteers or co-workers | 5.36 | 1.53 | 261 |
| Acknowledgment/support from other PT's | 5.34 | 1.59 | 261 |
| Acknowledgment/funds from government | 5.33 | 1.70 | 261 |
| An unfulfilled need for preventive PT | 5.30 | 1.68 | 260 |
| Advertising for my preventive PT interventions | 5.27 | 1.51 | 260 |
| Acknowledgment/support from other health prof's | 5.16 | 1.63 | 260 |
| Legal advice if needed (for planning, defense) | 4.99 | 1.59 | 261 |

*Scale 0 to 7, 0 = unimportant, 7 = important.

Table 10

Other Write-In Outcome Beliefs

| Outcome belief | Juniors | | Seniors | | Masters | | Graduates | | Adv. Masters | |
|---|---|---|---|---|---|---|---|---|---|---|
| | n | % | n | % | n | % | n | % | n | % |
| Cost, money, reimbursement | 3 | 12.0 | 0 | 0.0 | 6 | 14.6 | 4 | 18.2 | 1 | 11.1 |
| Public awareness | 3 | 12.0 | 5 | 23.8 | 10 | 24.4 | 8 | 36.4 | 0 | 0.0 |
| Scope/quality of physical therapy | 3 | 12.0 | 0 | 0.0 | 1 | 2.4 | 3 | 13.6 | 0 | 0.0 |
| Marketing, PT referrals | 1 | 4.0 | 0 | 0.0 | 3 | 7.3 | 0 | 0.0 | 3 | 33.3 |
| Fewer injuries, healthier people | 6 | 24.0 | 3 | 14.3 | 6 | 14.6 | 3 | 13.6 | 4 | 44.4 |
| Personal satisfaction | 1 | 4.0 | 2 | 9.5 | 1 | 2.4 | 0 | 0.0 | 0 | 0.0 |
| Other | 5 | 20.0 | 6 | 28.6 | 4 | 9.8 | 0 | 0.0 | 0 | 0.0 |

This table is based on 44.3% of respondents, 148 cases missing.

Table 11

Other Write-In Referent Beliefs (Persons or Groups)

| Person(s) or group(s) | Juniors | | Seniors | | Masters | | Graduates | | Adv. Masters | |
|---|---|---|---|---|---|---|---|---|---|---|
| | n | % | n | % | n | % | n | % | n | % |
| Service organizations | 0 | 0.0 | 1 | 6.3 | 1 | 3.2 | 1 | 6.7 | 0 | 0.0 |
| Friends | 0 | 0.0 | 1 | 6.3 | 0 | 0.0 | 2 | 13.3 | 0 | 0.0 |
| Myself | 1 | 5.9 | 0 | 0.0 | 2 | 6.5 | 2 | 13.3 | 0 | 0.0 |
| News media | 0 | 0.0 | 1 | 6.3 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 |
| Employer | 1 | 33.3 | 1 | 6.3 | 0 | 0.0 | 1 | 6.7 | 0 | 0.0 |
| Other health professionals | 0 | 0.0 | 0 | 0.0 | 1 | 3.2 | 1 | 6.7 | 0 | 0.0 |
| Coaches | 0 | 0.0 | 1 | 6.3 | 0 | 0.0 | 0 | 0.0 | 1 | 20.0 |
| Patients | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 1 | 20.0 |
| Other | 4 | 23.5 | 3 | 18.8 | 3 | 9.7 | 2 | 13.3 | 1 | 20.0 |

This table is based on 31.5% of respondents, 182 cases missing.

Table 12
Other Write-in Control Beliefs

| Control belief | Junior | | Senior | | Masters | | Graduate | | Adv. Masters | |
|---|---|---|---|---|---|---|---|---|---|---|
| | n | % | n | % | n | % | n | % | n | % |
| Cost, money, reimbursement | 3 | 23.1 | 2 | 14.3 | 3 | 11.1 | 3 | 16.7 | 2 | 33.3 |
| Mentors | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 1 | 5.6 | 0 | 0.0 |
| Research showing efficacy | 0 | 0.0 | 0 | 9.9 | 0 | 0.0 | 1 | 5.6 | 0 | 0.0 |
| Willing/ motivated patients | 3 | 23.1 | 1 | 7.1 | 1 | 3.7 | 1 | 5.6 | 1 | 16.7 |
| Employer support | 0 | 0.0 | 0 | 0.0 | 2 | 7.4 | 1 | 5.6 | 0 | 0.0 |
| Public attitudes/ awareness | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 1 | 5.6 | 0 | 0.0 |
| Personal skills/ attitudes/ motivation | 0 | 0.0 | 0 | 0.0 | 1 | 3.7 | 1 | 5.6 | 0 | 0.0 |
| Other | 1 | 7.7 | 4 | 28.6 | 0 | 0.0 | 1 | 5.6 | 0 | 0.0 |

This table is based on 29.3% of respondents, 188 cases missing.

Categorized written-in outcome beliefs (Table 10) included cost concerns, public awareness, quality of physical therapy, marketing, fewer injuries, personal satisfaction, and an "other" category which included the following comments that preventive physical therapy outcomes would:

-Make me healthier and more aware

-Make me aware of my own personal prevention of injury

-Increase of public awareness might be limited to those people who give classes

-Change the general emphasis of physical therapy

-Change the focus of care from treating injury to increasing fitness and protection from injury

-Educate the physicians

-Involve patients in their health maintenance

-Empower people

-Create greater awareness of the body and its fragile equilibrium

-Give opportunity to spread the gospel of Jesus Christ

Categorized written-in referent beliefs about persons or groups who might or might not want you to do preventive physical therapy included service organizations, friends, myself, news media, employer, other health professionals, coaches, patients, and an "other" category (see Table 11). Comments included the following:

-Second party payors

-Government and insurance

-Slick Willy (aka Bill Clinton)

-National Health care

-Health reform

-Local government, media

-Exercise physiologists

-Children

-Homeless people

-Just God

Categorized written-in control beliefs regarding the availability of factors necessary to do preventive physical therapy included cost concerns, mentors, research proving efficacy, motivated patients, employer support, public awareness, personal skills, and an "other" category. Comments included the following:

-Target group employers (are important); the worker may want to learn it, but the boss may not want to incorporate it into the work program

-I'll do it as long as it doesn't put me out of work

-Whether it is profitable, helps people and is not just another pie in the sky panacea

-...if I am required by the facility that I am working at to do preventive physical therapy

-The type of preventive physical therapy which will need to be done (enjoy screening but not work hardening)

## Testing the Model

One-way analysis of variance tests (Table 13) indicated no significant differences in perceived control between the classes or in intention to do preventive physical therapy. Although F probabilities showed significant differences between classes in attitude and also in subjective norm, Tukey's Honestly Significant Difference test indicated that no two groups are significantly different at the .05 level for either attitude or subjective norm.

See Figure 2 for results of the multiple regression analysis. Intention to do preventive physical therapy was related to attitude, subjective norm, and perceived control. The significant variable components are indicated, as well as the fact that there were three negative beta weights.

Tables 14, 15, and 16 list all questionnaire beliefs (outcome, referent, and control) from high to low by the correlation coefficient r. The beliefs significantly correlated with attitude, subjective norm, and perceived control are indicated by asterisks on the r coefficient. Beliefs that have significant betas appear in Figure 2 as the predictors of attitude, subjective norm and perceived control in the Ajzen model of the Theory of Planned Behavior.

## Overview of Significant Predictors

Results of the hierarchical multiple regression indicate that the attitude of physical therapy students, their perceptions of other persons or groups (subjective norm), and the availability of certain factors (perceived control) when considered together predicted the intention of physical therapy students to do preventive physical therapy sharing 48% of the variance (R = .69). Of the three individual predictors, the highest correlation with

Table 13
One-way Analysis of Variance Tests Showing Differences* Between Classes by Theory Variables

| | Intention | Attitude | Subjective Norm | Perceived Control |
|---|---|---|---|---|
| Juniors | 7.08 | 7.39 | 5.73 | 6.58 |
| Seniors | 7.03 | 7.53 | 5.79 | 6.26 |
| Masters | 7.11 | 7.80 | 6.36 | 6.45 |
| Graduates | 7.53 | 8.06 | 6.07 | 5.97 |
| Advanced Masters | 7.49 | 7.95 | 6.24 | 6.67 |
| Degrees of frequency | 4, 261 | 4, 250 | 4, 260 | 4, 260 |
| F Ratio | 1.03 | 2.52 | 2.45 | 1.66 |
| Signif. | .390 | .042 | .047 | .160 |

*Scale 1 to 9, with 1 = disagree or unlikely, 9 = agree or likely

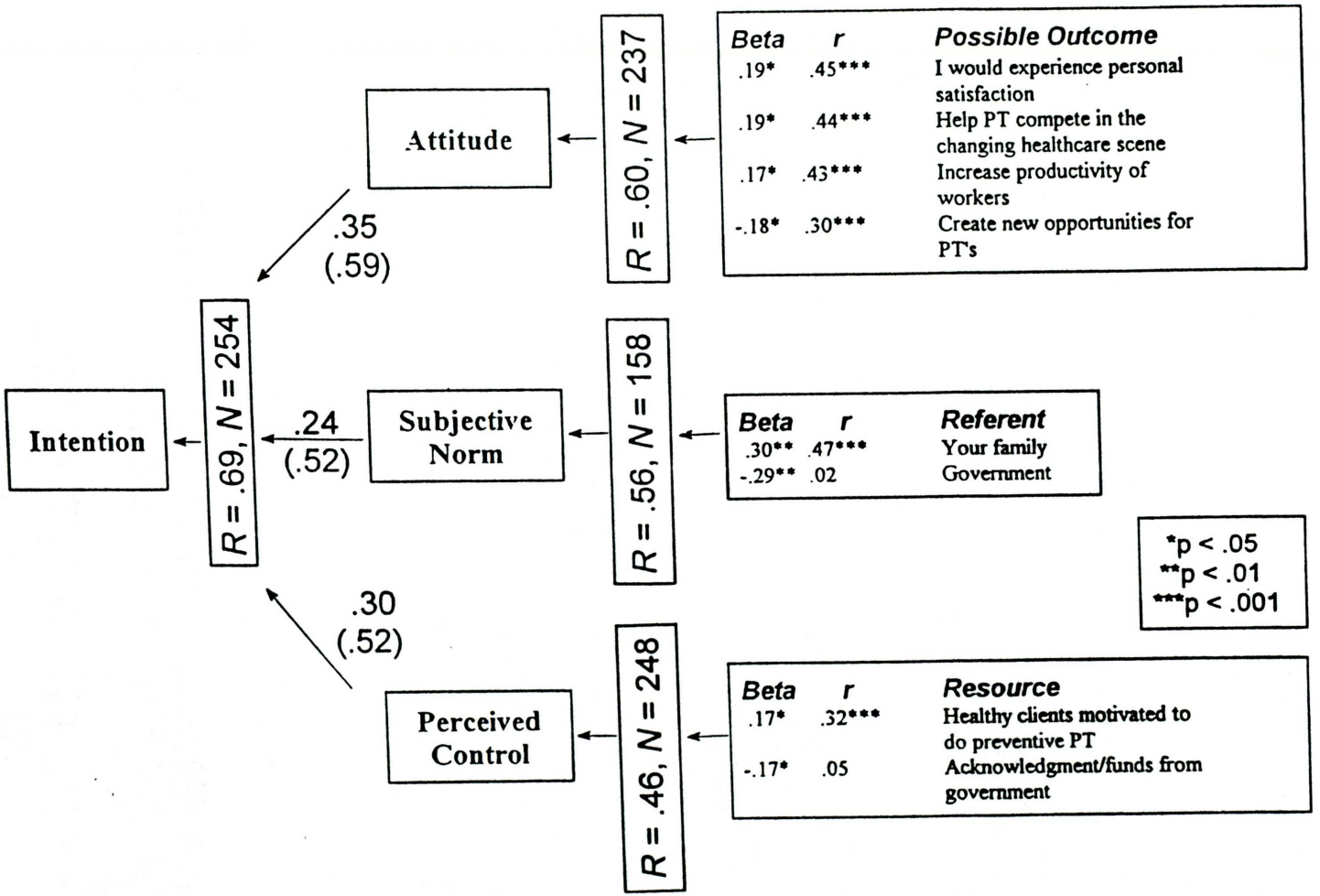


Figure 2. Path diagram for prediction of intention to do preventive physical therapy (after multiple regression). Based on the Theory of Planned Behavior. Numbers in rotated text boxes are R's from multiple regression. Numbers in parentheses next to arrows are correlations, numbers not in parentheses are beta coefficients. All R's, correlations and beta weights on paths are significant at $p < .00005$.

Table 14

Outcome Beliefs Sorted in Order of Correlation Coefficients Relating Attitude to Respondents' Perceived Likelihood of Occurrence.

| *r* | *Possible Outcome* |
|---|---|
| .45*** | I would experience personal satisfaction (i.e. helping people) |
| .45*** | It would increase general education/awareness |
| .44*** | It would help PT compete in the changing healthcare scene |
| .43*** | It would increase productivity of workers |
| .39*** | It would lead to a healthier society, less disability and injury |
| .37*** | It would save money for everyone |
| .35*** | It would prevent PT problems before they occur |
| .33*** | I could market my PT skills or practice |
| .32*** | I would present information to large groups |
| .31*** | I would work with healthy people |
| .31*** | It would market PT as a profession |
| .30*** | I could do research on preventive PT |
| .30*** | It would create new opportunities for PT's |
| .29*** | Fewer patients would need PT for acute injuries |
| .20** | I might not be paid for preventive PT |
| .12 | It would allow less hands-on care of patients |
| .00 | There would be less jobs for PT's |
| -.06 | It would allow less time for my family or myself |

* $p < .05$, ** $p < .001$.

Table 15

Referent Beliefs Sorted in Order of Correlation Coefficients Relating Subjective Norm to Respondents' Perceived Referent Desires.

| *r* | *Referent* |
|---|---|
| .47*** | Your family |
| .44*** | Patients' family(ies) |
| .31*** | Other PT's |
| .29*** | Target groups, people you teach |
| .28*** | The public |
| .28*** | Schools |
| .25** | Fitness people (i.e. health clubs) |
| .21** | Hospitals |
| .21** | Other health professionals |
| .18* | Physicians |
| .17* | Your employer |
| .13 | Patients' employer(s) |
| .10 | Insurance companies |
| .02 | Chiropractors |
| .02 | Government |

* $p < .05$, ** $p < .01$, *** $p < .001$.

Table 16

Control Beliefs Sorted in Order of Correlation Coefficients Relating Perceived Control to Respondents' Perceived Availability of the Factors.

| *r* | *Resource* |
|---|---|
| .33*** | Space/environment for teaching |
| .32*** | Healthy clients motivated to do preventive PT |
| .31*** | Help from volunteers or co-workers |
| .31*** | Invitations to do preventive PT |
| .31*** | Understanding the target group well |
| .30*** | Time to do preventive PT |
| .29*** | Positive public attitudes |
| .29*** | Advertising for my preventive PT interventions |
| .27*** | Legal advice if needed (for planning, defense) |
| .26*** | Educational materials (videos, books, etc) |
| .25*** | Research/journal information |
| .25*** | Adequate PT personal skills (i.e. verbal, others) |
| .20** | Acknowledgment/support from MD's |
| .18** | Acknowledgment/support from other health professionals |
| .17** | An unfulfilled need for preventive PT |
| .13* | Acknowledgment/funds from insurance |
| .12 | Acknowledgment/support from other PT's |
| .09 | Acknowledgment/funds from HMO's |
| .05 | Acknowledgment/funds from government |

* $p < .05$, ** $p < .01$, *** $p < .001$.

intention is attitude; intention and attitude share 35% of the variance ($\underline{r}$ = .59). Subjective norm ($\underline{r}$ = .52) and perceived control ($\underline{r}$ = .52) each share 27% of the variance with intention to do preventive physical therapy.

Perceived outcome beliefs, or what students believe will happen if preventive physical therapy occurs, predicted the attitude of physical therapy students, sharing 36% of the variance ($\underline{R}$ = .60). The outcome beliefs which most strongly contributed to the attitude of physical therapy students toward preventive physical therapy were personal satisfaction (20%, $\underline{r}$ = .45), helping physical therapy compete in the changing healthcare scene (19%, $\underline{r}$ = .44), increasing productivity of workers (18%, $\underline{r}$ = .43) and creating new opportunities for physical therapists (9%, $\underline{r}$ = .30).

Students' perceptions about persons or groups (referents) predicted the subjective norm sharing 31% of the variance ($\underline{R}$ = .56). Only two referents achieved significance, the physical therapist's family (22%, $\underline{r}$ = .47) and government (.04%, $\underline{r}$ = .02). The negative beta for government (-.29) may have indicated a lack of perceived personal control because of the government's control of resources.

Beliefs about the availability of items necessary to do preventive physical therapy predicted perceived control sharing 21% of the variance ($\underline{R}$ = .46). The significant resources were healthy clients motivated to do preventive physical therapy (10%, $\underline{r}$ = .32) and acknowledgement and/or funds from government (.25%, $\underline{r}$ = .05). Government involvement again initiated a negative beta (-.17).

## Factor Analysis

Because of the cryptic nature of the negative partial associations for government and the high intercorrelations among beliefs, we decided to use factor analysis to produce variables that would summarize the complex patterns which were found. Principal component analysis with varimax rotation was performed to determine how physical therapy students view beliefs as the sources of attitude, subjective norm, and control. Tables 17, 18, and 19 show the factors and the beliefs which compose them. Figure 3 is a path diagram showing the beliefs after factor analysis.

Factor analysis of the component beliefs of attitude indicated that four factors were involved. These four factors include variables which relate to the same concept. After scrutinizing these factors and obtaining factor loadings, we gave meaningful names to the factors perceived to result from preventive physical therapy as follows (see Table 16):

1. Professional and Social Benefits--the first factor was called professional and social benefits because the items that loaded most heavily seemed to relate to benefits to physical therapy as a profession and society as a whole.
2. Patient Benefits--the second factor was called patient benefits since these variables related to the advantages provided to patients from preventive physical therapy.
3. Physical Therapy Practice--this third factor included items that related to the practice of physical therapy by physical therapists.
4. Negative Outcomes--the fourth factor described negative aspects of doing preventive physical therapy.

Table 17

Factor Scores* for Outcome Beliefs

| Outcome beliefs | Professional & Social Benefits Factor 1 | Patient Benefits Factor 2 | Physical Therapy Practice Factor 3 | Negative Outcomes Factor 4 |
|---|---|---|---|---|
| It would create new opportunities for PT's | 0.83 | 0.14 | 0.18 | 0.08 |
| It would market PT as a profession | 0.81 | 0.08 | 0.17 | 0.10 |
| It would help PT compete in the changing healthcare scene | 0.72 | 0.21 | 0.31 | 0.00 |
| It would lead to a healthier society, less disability and injury | 0.71 | 0.36 | 0.02 | 0.14 |
| It would increase general education/awareness | 0.61 | 0.37 | 0.27 | -0.07 |
| It would increase productivity of workers | 0.56 | 0.47 | 0.17 | 0.05 |
| I could market my PT skills | 0.52 | 0.18 | 0.44 | -0.32 |
| Fewer patients would need PT for acute injuries | 0.16 | 0.82 | 0.12 | 0.09 |
| It would prevent PT problems before they occur | 0.29 | 0.82 | 0.07 | 0.07 |
| It would save money for everyone | 0.36 | 0.68 | 0.13 | 0.10 |
| I would experience personal satisfaction | 0.45 | 0.48 | 0.27 | -0.13 |
| I could do research on preventive PT | 0.34 | 0.01 | 0.70 | 0.12 |
| I would present information to large groups | 0.27 | 0.11 | 0.70 | 0.06 |
| I would work with healthy people | 0.39 | 0.29 | 0.52 | -0.20 |
| It would allow less hands-on care of patients | 0.14 | 0.41 | 0.51 | 0.34 |
| There would be less jobs for PT's | 0.04 | 0.16 | -0.06 | 0.77 |
| It would allow less time for my family or myself | 0.07 | -0.09 | 0.01 | 0.59 |
| I might not be paid for preventive PT | 0.01 | 0.25 | 0.32 | 0.54 |

* Principal Components Factor Analysis with Varimax Rotation.
Spaces between outcome beliefs indicate the different factor loadings.

Table 18

Factor Scores* for Subjective Norm Beliefs

| Normative beliefs | People Factor 1 | Unpredictable Groups Factor 2 | Authority Factor 3 |
|---|---|---|---|
| Your family | 0.79 | 0.02 | 0.17 |
| Patients' family(ies) | 0.79 | 0.02 | 0.28 |
| Schools | 0.77 | 0.26 | 0.14 |
| Other PT's | 0.66 | 0.23 | 0.08 |
| Fitness people (i.e. health clubs) | 0.62 | 0.42 | -0.06 |
| Target groups, people you teach | 0.54 | 0.03 | 0.44 |
| The public | 0.54 | 0.14 | 0.53 |
| Other health professionals | 0.51 | 0.49 | 0.23 |
| Physicians | 0.27 | 0.76 | 0.18 |
| Insurance companies | -0.08 | 0.71 | 0.43 |
| Chiropractors | 0.08 | 0.71 | 0.14 |
| Hospitals | 0.43 | 0.62 | 0.05 |
| Patients' employers | 0.09 | 0.24 | 0.83 |
| Government | 0.10 | 0.52 | 0.62 |
| Your Employer | 0.32 | 0.14 | 0.53 |

* Principal Components Factor Analysis with Varimax Rotation.
Spaces between subjective norm beliefs indicate the different factor loadings.

Table 19

Factor Scores* for Control Beliefs

| Control beliefs | Educational Resources Factor 1 | Funding Factor 2 | Health Profess. Support Factor 3 |
|---|---|---|---|
| Understanding the target group well | 0.79 | 0.10 | 0.23 |
| Advertising for my preventive PT interventions | 0.77 | 0.28 | -0.01 |
| Adequate PT personal skills (i.e. verbal, other) | 0.77 | -0.03 | 0.19 |
| Space/environment for teaching | 0.77 | 0.03 | 0.19 |
| Educational materials (videos, books etc) | 0.76 | 0.02 | 0.22 |
| Invitations to do preventive PT | 0.76 | 0.19 | 0.11 |
| Positive public attitudes | 0.70 | 0.15 | 0.30 |
| Help from volunteers or co-workers | 0.65 | 0.17 | 0.38 |
| Research/journal information | 0.64 | 0.10 | 0.32 |
| Time to do preventive PT | 0.61 | 0.19 | 0.28 |
| Legal advice if needed (for planning, defense) | 0.61 | 0.35 | 0.03 |
| Healthy clients motivated to do preventive PT | 0.53 | 0.14 | 0.27 |
| An unfulfilled need for preventive PT | 0.50 | 0.09 | 0.28 |
| Acknowledgment/funds from insurance | 0.13 | 0.91 | 0.16 |
| Acknowledgment/funds from HMO's | 0.12 | 0.89 | 0.16 |
| Acknowledgment/funds from government | 0.15 | 0.78 | 0.25 |
| Acknowledgment/support from other health prof's | 0.26 | 0.22 | 0.85 |
| Acknowledgment/support from other PT's | 0.28 | 0.18 | 0.83 |
| Acknowledgment/support from MD's | 0.33 | 0.35 | 0.59 |

* Principal Components Factor Analysis with Varimax Rotation.
Spaces between control beliefs indicate the different factor loadings.

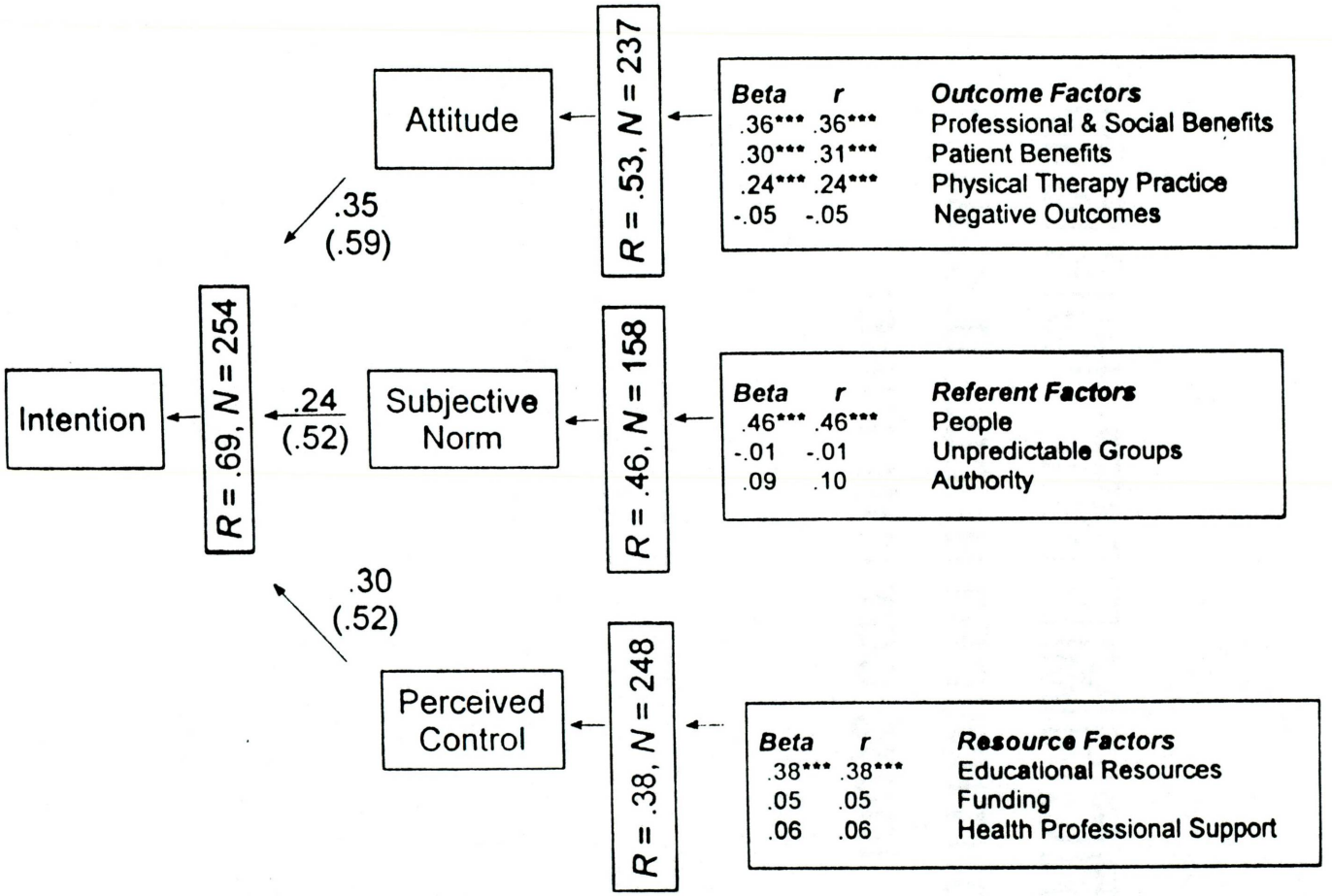


Figure 3. Path diagram for prediction of intention to do preventive physical therapy (after factor analysis). Based on the Theory of Planned Behavior and significant factors from factor analysis. Numbers in rotated text boxes are R's from multiple regression. Numbers in parentheses next to arrows are correlations, numbers not in parentheses are beta coefficients. All R's, correlations and beta weights on paths are significant at $p < .00005$. *** $p < .001$ for betas and r's of significant factors; betas and r's without asterisks in boxes indicate factors which are not significant.

Regression analysis of these four factors with attitude indicate that Social Benefits, Patient Benefits, and Physical Therapy Practice are all highly significant ($p < .00005$); Negative Outcomes was not significant.

Factor analysis of the component beliefs of subjective norm indicated that three factors were involved. These three factors are (see Table 18):

1. People--this first factor included the people primarily with whom physical therapists would have personal contact when doing preventive physical therapy.
2. Unpredictable Groups--Factor 2: students were highly variable in their judgments of the opinions of these groups. These groups had no influence on the subjective norm.
3. Authority--the third factor represented groups which could exert control over whether or not physical therapists do prevention.

Regression analysis revealed that the People factor was highly significant ($p < .00005$). The other two factors were not significant.

Factor analysis of the component beliefs of perceived control indicated three factors which were significant (see Table 18):

1. Educational Resources--Factor 1 contained a large number of variables which all loaded highly. They involved physical therapy preparational backgrounds and the necessary items to physically carry out preventive physical therapy activity.

2. Funding--the second factor included funds and funding sources needed to do preventive physical therapy.

3. Health Professional Support--the third factor included acknowledgement/ support from other health professionals including MD's and other physical therapists.

The result of the regression analysis showed that only Educational Resources was highly significant ($p < .00005$). Funding and Health Professional Support were not significant in the analysis.

Students tended to be unsure about what certain groups wanted them to do as indicated by high standard deviations in Table 6 for insurance companies, chiropractors, government, hospitals, and physicians. Table 7 indicates that students also tended to disagree about how much they wanted to comply with these groups. None of the groups were portions of factors which predicted students' intentions to do preventive physical therapy.

# CHAPTER 5

# DISCUSSION

According to this sample of physical therapy student respondents at Loma Linda University, several factors predict intention to do preventive physical therapy. The study also revealed other concepts unrelated to Azjen's model but of practical value in raising awareness for prevention in the field of physical therapy.

## U. S. vs Europe

Literature indicates a difference in attitudes toward primary prevention between U. S. physical therapists and European physical therapists. European articles from several different countries indicate strong interest in prevention (Hayne, 1988; Leathley & Stone, 1986; Leathley, 1988; Lyne, 1986; Lyne & Phillipson, 1986; Meier-Baumgartner, 1982; Moshkov, 1984; Norton, 1986; Robinson, 1986; Schule, 1981; Shore, 1986). While it is true that the American Physical Therapy Association has mandated the idea of prevention (1993b; 1994), little primary prevention is actually being reported. This notion is supported by findings in this survey which indicate that although the physical therapy student respondents became more familiar with preventive physical therapy as they progressed through the physical therapy curriculum, there is no significant difference between any of the classes in their intention to actually perform preventive physical therapy. The 1 to 9 intention score was divided into high, medium and low categories, with 7 to 9 designated as high intention. Although a trend did exist for more experienced respondents to have higher intention scores than the less experienced, this did not reach

statistical significance. High intention scores for each class were as follows: juniors, 63%; seniors, 60%; masters, 66%; graduates, 79%; and advanced masters 75%.

## Physical Therapy Student Respondent Perceptions

There appears to be no literature showing what physical therapy practitioners' beliefs predict in their attitude, subjective norm or perceived control toward doing preventive physical therapy or how these relate to their intention to practice preventive physical therapy. Determining these by surveying physical therapy students at Loma Linda was the purpose of this study.

Means from outcome variables (Tables 4 and 5) indicate that the outcomes which physical therapy students would value most they also believe would be most likely to occur; these two items correlate highly sharing 84% of their variance. Personal satisfaction was the most important item--it headed the lists for both likelihood and goodness. The other variables highest on both lists indicated that physical therapy students 1) want new opportunities and are concerned about marketing for physical therapy, and 2) want to benefit society with increased awareness and better health. They are less concerned about the fact that preventive physical therapy takes time, may not be paid for, and might cut down on the physical therapy job market.

Tables 6 and 7 showing subjective norm beliefs and strength of desire to comply reveals that physical therapy students have a very strong family orientation. Their own family and patients' families are highest on the list of persons with whom they wish to comply; these two are also highest on the list of people they feel would want them to do

preventive physical therapy. Others with whom they would like to comply are the target groups who receive instruction: schools, their employer, and the public. Interestingly, the desire to comply with the physical therapy employer was number four on the desire list, while the employer was not rated so highly (number ten) on the list of persons wanting them to do preventive physical therapy. It appears that respondents would desire to do preventive physical therapy more than they believed their employer would like them to do it. This illuminates the need for consciousness-raising among people who employ physical therapists; physical therapy education could target this need.

Student physical therapists were less concerned about complying with authority figures, payors, and referrers than with patient, family and public groups (Tables 6 and 7). Government, insurance companies, and physicians were low on the list of "desire to comply" and also low on the list of people they feel would want them to do preventive physical therapy. Apparently physical therapy students as a group are more public- and patient-oriented than political.

Tables 8 and 9 show student responses about the availability of controlling factors and their importance for doing preventive physical therapy. The item physical therapy students considered most important and the most available was adequate physical therapy personal skills; they felt capable of personally accomplishing preventive physical therapy. The factors thought to be next highest on the list of important resources were items involved with actual performance of the service (i.e. time, clients, positive attitudes, space). Next on the list came funders and referrers (except for government which was

lower on the list). The funders, however, all appeared on the bottom of the list "perceived to be available." Physical therapy students apparently felt they were quite able to do preventive physical therapy but probably won't be paid or acknowledged for it.

On write-in responses respondents mentioned the need for mentors as another needed resource. A lack of mentors was mentioned in the literature as a problem in training allied health students for prevention (Wynder, 1981), and regular clinical mentoring for students in preventive physical therapy did not exist.

Factor analysis of these data revealed highly significant factors predicting attitude, subjective norm, and perceived control. These predict intention, according to Ajzen's Theory of Planned Behavior. Although no physical therapy literature existed relating to such predictions, physical therapy articles did discuss the concepts found in factor beliefs. I will briefly discuss these factor by factor below (Tables 17, 18 and 19).

Predictors of Attitude Toward Doing Preventive Physical Therapy

Professional and Social Benefits (Factor 1). Those who believed that preventive physical therapy would result in benefits to the profession of physical therapy or society tended to be more favorable toward their doing preventive physical therapy. While a manpower shortage in the field of physical therapy currently exists (APTA, 1990, May; Davis, 1988; Mayer, 1987; "President's Perspective," 1991, p.3; Russell, 1990) and British physical therapists listed "overwhelming work" as a problem preventing health education by physical therapists (Leathley, 1988), this research indicated that physical therapy students were nevertheless interested in new opportunities for physical therapists, in

marketing themselves and their profession, and this factor created a positive attitude toward preventive physical therapy.

Patient Benefits (Factor 2). A belief that patients would benefit from preventive physical therapy was also associated with a more positive attitude toward intention to do preventive physical therapy. The idea of physical therapists experiencing personal satisfaction while saving money for everyone and preventing physical injuries is alluded to in Glenda Key's new Industrial Therapy text which attempts to create positive attitudes toward prevention in the workplace. The text suggests that therapists exhibit "a responsive, positive interaction with the patient and other involved parties..." (page 14).

Physical Therapy Practice (Factor 3). These variables deal with how physical therapists actually do physical therapy. Those believing physical therapy would lead to physical therapists being able to do research on preventive physical therapy, speak to large groups, work with healthy people and do less hands-on care and who evaluated these highly were more likely to favor doing preventive physical therapy.

A belief of having less time, less money, and fewer physical therapy jobs did not relate to whether or not students evaluated their own practice of physical therapy prevention highly (Negative Outcomes, Factor 4). Perhaps students have minimal job concerns because the manpower shortage (mentioned above) is well-known to physical therapy students.

## Predictors of Subjective Norm

People (Factor 1). These included primarily people with whom the physical therapist would have personal contact; families (physical therapists' and patients'), schools, other physical therapists, fitness people (i.e. health clubs), target groups to teach, the public, and other health professionals. Physical therapy students' feelings of what important others expected of them was influenced by these people. Physical therapy students appeared to have strong family orientation. What physicians, insurance companies, chiropractors, and hospitals wanted them to do did not contribute to their sense of what they ought to be doing, probably because students did not consistently indicate what these groups wanted them to do (Unpredictable Groups, Factor 2). Nor did physical therapists' or patients' employers or the government influence strongly their preventive physical therapy attitudes (Authority, Factor 3) .

## Predictors of Perceived Control

Educational Resources (Factor 1). The factor which alone predicted perceived control included thirteen variables primarily involving the knowledge and physical details for accomplishing the task. It included understanding the target group, advertising, personal skills, space and materials for teaching, and invitations to teach. It also included positive public attitudes, help from volunteers, research information, time, legal advice, and an unfulfilled need for preventive education. Students also believed they needed motivated healthy patients who needed the service, hinting at the ever-present patient compliance issue (Sluijs, 1991). Funding (Factor 2) from insurance, HMO's and

government and Health Professional Support (Factor 3) including other physical therapists and MD's were not significant predictors of perceived control.

### Predictors of Intention to Practice Preventive Physical Therapy

Of the three predictors of intention described in Azjen's model (attitude, subjective norm, and perceived control), the strongest predictor of intention to practice preventive physical therapy was attitude, while the weakest predictor was perceived control. This suggests that outcome beliefs from the three factors predicting attitude (Professional and Social Benefits, Patient Benefits, and Physical Therapy Practice) are the most closely associated with intention to do preventive physical therapy. Knowledge of these beliefs can be used to increase physical therapy students' positive attitudes toward preventive physical therapy.

# CHAPTER 6

# SUMMARY AND CONCLUSIONS

## Summary

Statistical analysis by multiple regression and by factor analysis indicated that the attitude of physical therapy students toward primary prevention can be predicted by several factors. These factors are composed of beliefs about Professional and Social Benefits, Patient Benefits, and Physical Therapy Practice. Negative Outcomes including fewer jobs, less personal time, and lack of payment did not predict attitude. Only relationships of People with whom the physical therapist would have personal contact were likely to relate to students' feelings of what important others wanted them to do. What physicians, insurance companies, chiropractors, hospitals, employers, and government (Unpredictable Groups and Authority) wanted them to do was not relevant. The important factor predicting a sense of control for doing preventive physical therapy was the Educational Resources needed to actually perform the intervention. Funding from insurance, HMO's and government was not relevant, nor was Health Professional Support including other health professionals, physical therapists and physicians.

## Relevance to Health Education

A useful enhancement of physical therapy educational preparation may emerge from this research and analysis. Physical therapy student attitudes and beliefs about primary prevention have not previously been studied. No reliable assessment instrument has existed for this purpose.

The field of physical therapy, with its orientation to practical application of skills, has grown mainly in only two of the three learning domains (Pratkanis, 1989). Cognitive and psychomotor areas have advanced greatly over time, but the affective domain of attitudes and values has received little emphasis. Physical therapy educators have not given enough attention to fostering beliefs that will lead to a positive attitude toward practicing prevention. Physical therapy educational programs have recently moved from bachelor's level entry to master's, and some programs are initiating doctorates. The time is ripe for physical therapy to examine its seasoned stance of hands-on tertiary care (APTA, 1994) and to include primary prevention.

As discussed above, physical therapy student respondents indicated no strong intention to do preventive physical therapy, although some are familiar with the concept. Beliefs about attitude, subjective norm, and perceived control predict intention to carry out preventive physical therapy. Knowledge of these predictors and the beliefs most highly associated with each allows focus upon the important factors for planning curriculum changes in educational programs.

The predictive outcome beliefs in Factor 1 (Professional and Social Benefits) include several items which can be used in educational curricula. If Azjen's theory is correct then changing these should produce positive attitudes toward preventive physical therapy. The prospect of new opportunities for physical therapists and marketing physical therapy both as a profession and personal skills show a strong relationship to attitude, as does the idea of helping physical therapy compete in the changing healthcare scene.

Factor 1 also includes the social benefits of a healthier society, increasing public education and awareness and increasing productivity of workers. Courses which increase these beliefs should create a more positive attitude.

Another strong predictor of attitude, Patient Benefits (see Factor 2), contained beliefs about fewer acute injuries, preventing physical therapy problems, saving money, and personal satisfaction for the therapist. This suggests that increasing any of these beliefs would improve physical therapy student attitude toward prevention.

The third significant predictor group, Factor 3, involves Physical Therapy Practice. Physical therapy students might improve their attitude toward preventive physical therapy if their beliefs were strengthened that they could do research on preventive physical therapy, present information to large groups, work with healthy people, and do less hands-on care. Of course this last association might simply indicate that those who find hands-on care unattractive are the most likely to want to do preventive physical therapy. Whether it would be good for the profession as a whole to lower desire to do hands-on physical therapy is problematic. The Negative Outcomes, Factor 4, did not incur a relationship with the students' attitude about preventive physical therapy. The fact that there would be less jobs, less personal time, and possibly no pay for teaching prevention was not related to attitude. Therefore there would seem to be no need to emphasize these in the curriculum.

Normative predictor beliefs about people are important to students' perceptions regarding their intention to practice preventive physical therapy. People (Factor 1) who

affect therapists are those with whom they have personal contact including their own families and patients' families, schools, and other physical therapists . Their plans about prevention are also affected by fitness people such as health clubs, target groups they would teach, the public, and other health professionals. If physical therapy students believed these groups of people wanted them to do prevention, their intention to do so should be improved.

Some groups of people do not affect the intention of physical therapy students to do prevention (Factors 2 and 3). The desires of physicians, insurance companies, chiropractors and hospitals (Unpredictable Groups) do not predict their prevention plans. Neither employers or the government (Authority) have a significant relationship with what students plan to do. They are not greatly concerned about these with regard to performing preventive physical therapy.

Only one additional factor discovered from the model might be used as a basis for inducing change. Physical therapy students believe that they would have adequate control for doing preventive physical therapy if they have the Educational Resources to carry it out. The resources include items necessary to accomplish the intervention: understanding the target group, advertising, adequate physical therapy skills, a place to teach, and educational materials to use. They also believe they need an invitation to teach, positive public attitudes, help from co-workers, research information, and the time to do their intervention. They would like to have legal advice if they needed it, and teach motivated

healthy clients who need to be instructed about preventive physical therapy. Increasing any of these beliefs should improve students' intention to do preventive physical therapy.

The two remaining factors (Factors 2 and 3) regarding perceived control are not important predictors for student prevention plans. Funding by insurance, HMO's, and government did not relate with intention; neither did Health Professional Support including MD's and other physical therapists. The students apparently feel that the government and other funding sources are not supportive, but that it is not very important to be paid for prevention (Factor 3, Negative Outcomes). This is not a practical concept in physical therapy practice, since people generally work for pay. Improving the value score for government would only decrease the intention to do preventive physical therapy if physical therapy students felt the government was important but that it would not pay. Program curricula should increase both practical awareness of need for pay from government and the education of how to effect political change to bring about payment if a more realistic approach to factors necessary to do prevention is not to result in less intention to do prevention.

Factor 1 in outcome beliefs (Professional and Social Benefits) includes the idea of increasing education and awareness as part of the predictor of attitude. The increased public awareness would likely produce in turn an increased utilization of physical therapy services and help to market physical therapy. To increase awareness, physical therapists must become involved in their communities and be more visible to the public. This has not been a strong thrust in physical therapy education in the past. Classes in physical therapy

schools could teach skills in group dynamics, writing, mass media and other community involvement. Knowledge of political process would increase physical therapy awareness. These factors could be learned best by students from physical therapy mentors who themselves were involved in preventive physical therapy. Structure should include objectives in all areas of Bloom's Taxonomy for knowledge, comprehension, application, analysis, synthesis and evaluation.

Information from this study can be shared with students, faculty and clinicians to raise awareness. Courses throughout the physical therapy program can include the concept of primary prevention; new courses can be added. Students may become involved in local preventive programs; when these students graduate and reach clinical practice they will already have preventive physical therapy experience. By continuing this preventive physical therapy practice, they will become clinical examples for other students to model.

## Raising Awareness for Physical Therapy Primary Prevention

Literature states the importance of raising awareness about prevention; student respondents also recognized the need for increasing general education and awareness in the predictive factor Professional and Social Benefits. To raise general awareness for physical therapy primary prevention, and to improve the physical therapy professional preparation curriculum, the following areas should be addressed:

1. Physical Therapy Educational Institutions

    (a) Develop coursework which instructs physical therapy students in primary prevention;

(b) Incentivize faculty involvement in physical primary prevention in the community; and

(c) Emphasize faculty research in physical therapy primary prevention which includes student participation.

2. Professional Associations

(a) Publish articles in American Physical Therapy Association journals illustrative of physical therapy primary prevention;

(b) Emphasize physical therapy primary prevention in national and regional Association meetings;

(c) Offer continuing education courses in physical therapy primary prevention; and

(d) Encourage expansion of the Public Health Section of American Physical Therapy Association (presently limited to home health) to include primary prevention.

3. Public Education

(a) Utilize mass media (TV and radio talk shows, public service announcements, magazine articles) to emphasize physical therapy primary prevention.

4. Political Process

(a) Join and support political action groups to emphasize importance of physical therapy primary prevention; and

(b) Utilize the political and legal systems for bolstering funding for physical therapy preventive services.

Specific recommendations to the Department of Physical Therapy, Loma Linda University, based upon the results of this study, are as follows:

1. Include as the basis for the present health promotion course in the MPT curriculum (PHTH 408 Aspects of Health Promotion) the five predictive factor beliefs identified in this study.

2. Prepare a video presentation of preventive physical therapy in action through case study format, depicting the five predictive factor beliefs identified in this study.

3. Target the need for PT employers to encourage preventive PT.

4. Examine present MPTcoursework regarding political process. Implement specific information enabling students to instigate government change. Include in the doctoral program (DPT) a course to expand political awareness of physical therapy students, with emphasis on practical details of achieving political change to support preventive physical therapy.

5. Emphasize interdisciplinary teams in clinical practice of preventive physical therapy, since students in this present study seemed to view prevention to be a do-it-yourself project.

Literature articles suggest or create possibilities for the following changes in addition to the specific recommendations based on statistical results of this study:

1. Seek clinical sites for student preventive practice so that mentoring may occur.

2. Create a laboratory experience in which students utilize a worksite, collect statistics regarding worksite injuries, identify cost-benefit to be achieved through preventive physical therapy, and design a worksite health promotion program.

3. Initiate interdisciplinary research in preventive care within the School of Allied Health Professions.

If faculty consciousness is raised toward the concept of prevention, physical therapy primary prevention may be instilled as a thread throughout the physical therapy program.

## Recommendations for Future Research

Since this study was limited to students enrolled in the program at Loma Linda University, results are not generalizable beyond that university program. The instrument developed on the Ajzen model, however, could be utilized by other physical therapy professional preparation programs to initiate, improve or evaluate their emphasis on preventive physical therapy and health promotion. A useful addition to the questionnaire might be questions on mentoring or clinical modeling. Further research should discover whether program changes based on the Theory of Planned Behavior actually impacted the beliefs of students. Additional research should also explore the role of preventive physical therapy at the various levels of professional preparation: physical therapist assistant, bachelors and masters entry level programs, advanced masters and doctoral programs.

Roles are, at present, poorly defined with little concerted effort to include preventive physical therapy.

Physical therapy primary prevention efficacy studies in many areas of the field would validate need, enhance credibility, and serve as a basis for prevention practice.

Other research which could conceivably influence the practice of preventive physical therapy would be a study of attitudes within the general public. Do they view physical therapists as sources of prevention as well as of therapy? Whom do they see as the most ideal to provide musculoskeletal care and information? Answers to questions such as these could enhance the profession of physical therapy's move into preventive physical therapy.

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# APPENDIX

## ASSESSMENT OF STUDENT PERCEPTION ABOUT PREVENTIVE PT

This research is intended to study your attitude toward a new concept in PT–preventive PT. Participation in this survey is voluntary. If you do not wish to participate you do not have to fill out the form.

1. Age
   1[ ] ≤25
   2[ ] 26-30
   3[ ] 31-35
   4[ ] 36-40
   5[ ] >40

2. Sex 1[ ] Male 2[ ] Female

3. What was your PT work experience before entering the PT program at Loma Linda (including volunteer/observation)?
   1[ ] None or minimal
   2[ ] Less than one year
   3[ ] One to two years
   4[ ] More than two years

4. Since you entered the LLU PT program, on the average how many hours/week did you work in PT? (Include volunteer/observation time but exclude time spent as part of your program. Write NA if not applicable).
   Junior _____ hours/week
   Senior _____ hours/week
   Masters _____ hours/week

5. Other work experience in a medical field: (please list the field and time worked in this field)
   _____

6. Race
   1[ ] Hispanic
   2[ ] Black
   3[ ] Caucasian
   4[ ] Oriental
   5[ ] Other

7. Country of origin:
   1[ ] U.S. 2[ ] Other (please list)_____

8. Country of citizenship:
   1[ ] U.S. 2[ ] Other (please list)_____

9. Are you a licensed physical therapy assistant?
   1[ ] Yes 2[ ] No

10. Do you have (an) additional occupation(s) or degree(s)?
    1[ ] No 2[ ] Yes (list)
    _____
    _____
    _____

11. Education before entering PT masters program:
    Numbers of years of college _____

*Please read the following paragraph carefully. All of your answers depend upon your understanding of the new term "preventive physical therapy" ("preventive PT"):*

"Preventive PT" is defined as **TEACHING WELL PEOPLE HOW TO PREVENT DISEASE OR INJURY**. PT's usually treat patients hands-on AFTER they have a problem by evaluating, giving exercises and modalities, teaching them to avoid further problems, etc. Preventive PT is different! Preventive PT teaches HEALTHY PEOPLE (frequently in GROUPS), targeting them BEFORE they need rehabilitation. An example of preventive PT is back school for newly hired workers to prevent back injuries. Another example is teaching students proper sitting positions for study so that they avoid headaches, neck and back pain during long hours of study. Other examples are educating computer operators how to avoid repetitive stress injuries and teaching athletes to avoid injuries while doing sports.

CIRCLE THE SINGLE NUMBER that most represents your opinion about preventive PT for each question below. *Please do not skip any questions. If you are neutral or uncertain select a middle response.*

12. How familiar are you with the concept of preventive PT?
never heard of it 1 2 3 4 5 6 7 8 9 very familiar

13. I intend to do preventive PT in my PT practice.
agree 9 8 7 6 5 4 3 2 1 disagree

14. How likely is it that you will do preventive PT in your PT practice?
unlikely 1 2 3 4 5 6 7 8 9 likely

15. If everything goes as I plan I will do preventive PT in my PT practice.
disagree 1 2 3 4 5 6 7 8 9 agree

16. When you think about doing preventive PT in your PT practice how do you feel?
good 9 8 7 6 5 4 3 2 1 bad
punished 1 2 3 4 5 6 7 8 9 rewarded
pleasant 9 8 7 6 5 4 3 2 1 unpleasant

17. Most people or groups who are important to me think I should do preventive PT in my PT practice.
disagree 1 2 3 4 5 6 7 8 9 agree

18. I ought to do preventive PT in my PT practice.
disagree 1 2 3 4 5 6 7 8 9 agree

19. How much pressure do you expect to feel from other people to do preventive PT in your PT practice?
a great deal 9 8 7 6 5 4 3 2 1 none at all

20. When I finish the PT program I will have the ability to do preventive PT in my PT practice.
disagree 1 2 3 4 5 6 7 8 9 agree

21. For me doing preventive PT in my PT practice would probably be:
very easy 9 8 7 6 5 4 3 2 1 very difficult

22. How much control do you think you will have over whether you can do preventive PT in your PT practice?
very little 1 2 3 4 5 6 7 8 9 complete

23. How often do you think of your personal PT career as a primarily hands-on profession?
always 9 8 7 6 5 4 3 2 1 never

24. Check PT area(s) most interested in (one or more) a[ ] Ortho b[ ] Sports c[ ] Neuro d[ ] Peds e[ ] Cardiac f[ ] Geri g[ ] OB Gyn h[ ] Acute care i[ ] Home Health j[ ] Other_____

Please circle one number in the column numbered 25 and one number in the column numbered 26 for each possible outcome listed below:

| Outcome of doing preventive PT | 25. How likely is the outcome to occur? unlikely.....likely | 26. If the outcome occurred how bad or good would it be for you? bad.....good |
|---|---|---|
| It would prevent PT problems before they occur | a. 0 1 2 3 4 5 6 7 | a. 0 1 2 3 4 5 6 7 |
| I would experience personal satisfaction (i.e. helping people) | b. 0 1 2 3 4 5 6 7 | b. 0 1 2 3 4 5 6 7 |
| Fewer patients would need PT for acute injuries | c. 0 1 2 3 4 5 6 7 | c. 0 1 2 3 4 5 6 7 |
| It would save money for everyone | d. 0 1 2 3 4 5 6 7 | d. 0 1 2 3 4 5 6 7 |
| I could market my PT skills or practice | e. 0 1 2 3 4 5 6 7 | e. 0 1 2 3 4 5 6 7 |
| I would work with healthy people | f. 0 1 2 3 4 5 6 7 | f. 0 1 2 3 4 5 6 7 |
| I might not be paid for preventive PT | g. 0 1 2 3 4 5 6 7 | g. 0 1 2 3 4 5 6 7 |
| I could do research on preventive PT | h. 0 1 2 3 4 5 6 7 | h. 0 1 2 3 4 5 6 7 |
| It would help PT compete in the changing healthcare scene | i. 0 1 2 3 4 5 6 7 | i. 0 1 2 3 4 5 6 7 |
| There would be less jobs for PT's | j. 0 1 2 3 4 5 6 7 | j. 0 1 2 3 4 5 6 7 |
| It would increase productivity of workers | k. 0 1 2 3 4 5 6 7 | k. 0 1 2 3 4 5 6 7 |
| It would increase general education/awareness | l. 0 1 2 3 4 5 6 7 | l. 0 1 2 3 4 5 6 7 |
| It would allow less hands-on care of patients | m. 0 1 2 3 4 5 6 7 | m. 0 1 2 3 4 5 6 7 |
| I would present information to large groups | n. 0 1 2 3 4 5 6 7 | n. 0 1 2 3 4 5 6 7 |
| It would allow less time for my family or myself | o. 0 1 2 3 4 5 6 7 | o. 0 1 2 3 4 5 6 7 |
| It would market PT as a profession | p. 0 1 2 3 4 5 6 7 | p. 0 1 2 3 4 5 6 7 |
| It would create new opportunities for PT's | q. 0 1 2 3 4 5 6 7 | q. 0 1 2 3 4 5 6 7 |
| It would lead to a healthier society, less disability and injury | r. 0 1 2 3 4 5 6 7 | r. 0 1 2 3 4 5 6 7 |

27. What other outcomes might be important if you did preventive PT?

_____

_____

Below are a number of persons or groups who might or might not want you to do preventive PT in your PT practice. For each person or group please circle a number in column 28 and a number in column 29 to indicate 1) how much you think they want you to do preventive PT and 2) how much you want to do what they desire. If you do not know or if you have no relationship with a particular kind of person or group circle NA.

NA = Not applicable or do not know.

| Person(s) or group(s) | 28. How much do you believe this person or group wants you to do preventive PT? not at all.....very much | 29. How much do you want to do what this person or group desires? not at all.....very much |
|---|---|---|
| Your employer | a. 0 1 2 3 4 5 6 7 NA | a. 0 1 2 3 4 5 6 7 NA |
| Patients' employer(s) | b. 0 1 2 3 4 5 6 7 NA | b. 0 1 2 3 4 5 6 7 NA |
| Government | c. 0 1 2 3 4 5 6 7 NA | c. 0 1 2 3 4 5 6 7 NA |
| Insurance companies | d. 0 1 2 3 4 5 6 7 NA | d. 0 1 2 3 4 5 6 7 NA |
| Target groups, people you teach | e. 0 1 2 3 4 5 6 7 NA | e. 0 1 2 3 4 5 6 7 NA |
| Other PT's | f. 0 1 2 3 4 5 6 7 NA | f. 0 1 2 3 4 5 6 7 NA |
| Physicians | g. 0 1 2 3 4 5 6 7 NA | g. 0 1 2 3 4 5 6 7 NA |
| Chiropractors | h. 0 1 2 3 4 5 6 7 NA | h. 0 1 2 3 4 5 6 7 NA |
| The public | i. 0 1 2 3 4 5 6 7 NA | i. 0 1 2 3 4 5 6 7 NA |
| Other health professionals | j. 0 1 2 3 4 5 6 7 NA | j. 0 1 2 3 4 5 6 7 NA |
| Hospitals | k. 0 1 2 3 4 5 6 7 NA | k. 0 1 2 3 4 5 6 7 NA |
| Schools | l. 0 1 2 3 4 5 6 7 NA | l. 0 1 2 3 4 5 6 7 NA |
| Fitness people (i.e. health clubs) | m. 0 1 2 3 4 5 6 7 NA | m. 0 1 2 3 4 5 6 7 NA |
| Your family | n. 0 1 2 3 4 5 6 7 NA | n. 0 1 2 3 4 5 6 7 NA |
| Patients' family(ies) | o. 0 1 2 3 4 5 6 7 NA | o. 0 1 2 3 4 5 6 7 NA |

30. Are there any other persons or groups who might influence whether or not you do preventive PT?

_____

_____

Below is a list of factors which might enable you to do preventive PT. For each factor circle a number in column 31 and a number in column 32 to indicate 1) how available you think the factor will be to you 2) how important this factor is for doing preventive PT.

| Factors | 31. How available do you think this factor will be to you? not at all.....very available | 32. How important is this factor for doing preventive PT? unimportant.....important |
|---|---|---|
| Healthy clients motivated to do preventive PT | a. 0 1 2 3 4 5 6 7 | a. 0 1 2 3 4 5 6 7 |
| Acknowledgment/support from MD's | b. 0 1 2 3 4 5 6 7 | b. 0 1 2 3 4 5 6 7 |
| Acknowledgment/funds from government | c. 0 1 2 3 4 5 6 7 | c. 0 1 2 3 4 5 6 7 |
| Acknowledgment/funds from insurance | d. 0 1 2 3 4 5 6 7 | d. 0 1 2 3 4 5 6 7 |
| Acknowledgment/funds from HMO's | e. 0 1 2 3 4 5 6 7 | e. 0 1 2 3 4 5 6 7 |
| Acknowledgment/support from other PT's | f. 0 1 2 3 4 5 6 7 | f. 0 1 2 3 4 5 6 7 |
| Acknowledgment/support from other health prof's | g. 0 1 2 3 4 5 6 7 | g. 0 1 2 3 4 5 6 7 |
| Advertising for my preventive PT interventions | h. 0 1 2 3 4 5 6 7 | h. 0 1 2 3 4 5 6 7 |
| Legal advice if needed (for planning, defense) | i. 0 1 2 3 4 5 6 7 | i. 0 1 2 3 4 5 6 7 |
| Adequate PT personal skills (i.e.verbal, others) | j. 0 1 2 3 4 5 6 7 | j. 0 1 2 3 4 5 6 7 |
| Space/environment for teaching | k. 0 1 2 3 4 5 6 7 | k. 0 1 2 3 4 5 6 7 |
| Educational materials (videos, books etc) | l. 0 1 2 3 4 5 6 7 | l. 0 1 2 3 4 5 6 7 |
| Positive public attitudes | m. 0 1 2 3 4 5 6 7 | m. 0 1 2 3 4 5 6 7 |
| Time to do preventive PT | n. 0 1 2 3 4 5 6 7 | n. 0 1 2 3 4 5 6 7 |
| Research/journal information | o. 0 1 2 3 4 5 6 7 | o. 0 1 2 3 4 5 6 7 |
| Invitations to do preventive PT | p. 0 1 2 3 4 5 6 7 | p. 0 1 2 3 4 5 6 7 |
| Understanding the target group well | q. 0 1 2 3 4 5 6 7 | q. 0 1 2 3 4 5 6 7 |
| Help from volunteers or co-workers | r. 0 1 2 3 4 5 6 7 | r. 0 1 2 3 4 5 6 7 |
| An unfulfilled need for preventive PT | s. 0 1 2 3 4 5 6 7 | s. 0 1 2 3 4 5 6 7 |

33. Are there any other factors which might influence whether or not you do preventive PT?

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